The Boston Medical and Surgical Journal

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The Massachusetts Medical Society

SECTION OF PEDIATRICS

SESSION HELD AT PITTSFIELD, JUNE 13, 1923

HEART MURMURS IN INFANCY AND CHILDHOOD

BY JOHN LOVETT MORSE, A.M., M.D., BOSTON

A NOT inconsiderable number of physicians apparently still think that a precordial murmur in a child always indicates "heart disease," meaning by that term chronic valvular disease, and, when there really is chronic valvular disease, pay no attention to anything but the heart murmur. Others, while appreciating that precordial murmurs in children may be due to a variety of causes, are not very clear in their minds as to what the different murmurs are, how to distinguish them, or just what is their importance. It seemed to me worth while, therefore, although I have nothing new to add to the subject, except the results of my own experience, to go over the subject of precordial murmurs in children again and endeavor to sum up briefly our present knowledge regarding them. In the fifteen or twenty minutes at my disposal, there is not time for me to take up the murmurs in acute disease or in children with manifest evidences of chronic cardiac disease, whether congenital or acquired. I shall, therefore, limit myself to a consideration of the murmurs heard in the precordial area in children who are apparently well or who, at most, are poorly nourished or not quite up to standard physically.

CARDIO-PULMONARY MURMURS

A considerable number of the murmurs heard in the precordial region in early life are made outside the heart. They are rare in infants and most common in middle childhood. They are usually heard at the apex or along the left border of the heart, where the lungs cover it, but seldom at the base. They are almost always systolic in time, sometimes diastolic, seldom double. They are generally soft and blowing, but may be quite loud. They are usually sharply localized, but are sometimes transmitted. The intensity of these murmurs is often changed by the pressure of the stethoscope, the intensity, as a rule, being weakened. The most characteristic point about these murmurs is that they vary with respiration. They are sometimes louder in inspiration, sometimes in expiration. They cease when the breath is held. They are presumably due to the squeezing of air out of the alveoli at the edge of the lung, but may, perhaps, sometimes be due to the rushing in of air. This explanation may, however, not be the correct one. Further evidence to show that these murmurs are made outside the heart is that there are no other evidences of cardiac disease. The cardiac area is normal, the rate normal, the action regular, the sounds strong, and there is no change in the second pulmonic sound. Furthermore, there are no subjective symptoms. These murmurs are of no importance whatever.

Another extracardial murmur, which is also probably pulmonary in origin, is one which varies with the position of the child. It is usually most marked when the child is lying on its back, diminishes when it sits up, and disappears when it stands up. Sometimes, however, it may be heard loudest when the child is standing. This murmur is more common in boys than in girls, and is heard most frequently in middle and late childhood. The murmur is the only sign. There are no other evidences of cardiac disease. It is of no importance.

Still another murmur, which, while it is probably made in the vessels, is almost certainly due to pressure from outside, is a murmur which is very often heard over or above the manubrium in infancy and sometimes in early childhood. It is most marked when the head is extended, and often disappears when the baby is lying down or the head is flexed. It is almost certainly due to pressure on the innominate veins. This pressure, in some cases, is undoubtedly due to enlarged bronchial glands or to an enlarged thymus. The murmur can be brought out, however, in almost every infant by complete extension of the head when it is in the upright position. All infants certainly do not have enlarged bronchial glands or an enlarged thymus. This sound is of no value, therefore, in the diagnosis of these conditions, and, in fact, has no pathological significance.

SYSTOLIC MURMUR IN PULMONARY AREA

A systolic murmur in the pulmonary area, that is, in the second and third left interspaces, is very often heard throughout early life. It is so common that it may be regarded as physiological. I do not know, and doubt if anyone does, whether it originates inside or outside of the heart. It is always systolic in time and soft and blowing in character. It is usually rather limited in its distribution, but may be heard both below and to the right of the pulmonary area. It is seldom heard in the neck. There are no evidences of cardiac disease, either subjective or objective, associated with it. The heart is normal in size, the rate and rhythm are normal, the sounds of good strength, and the second pulmonic sound unchanged.

The only cardiac lesion with which it can possibly be confused in childhood is a congenital lesion at or near the pulmonary orifice. If there is such a lesion, there is often a thrill, and the murmur is rough, usually loud, and transmitted into the neck and back. The right side of the heart is often enlarged and the second pulmonic sound almost invariably weakened. There are usually other evidences of cardiac disease, such as cyanosis, clubbing of the extremities, bulging of the precordia and disturbance of nutrition. Confusion is hardly possible if the characteristics of the murmur and the differences in the condition of the heart and circulation in the two conditions are borne in mind.

FUNCTIONAL MURMURS

It may be wise before considering functional murmurs to review for a moment the etiology of intracardiac murmurs. Intracardiac murmurs are due to interference with the normal flow of the blood through orifices which are narrowed or roughened or to the formation of eddies in the flowing blood as the result of the reflux of blood through orifices which the valves do not entirely close. The failure of the valves to close may be because the orifice is dilated, the valves shrunken, or the nervous or the muscular control of the valves imperfect.

It is evident that when intracardiac murmurs are functional they must be due to the failure of the valves to close the orifice, and that this failure can only be due either to dilatation of the orifice or to the imperfect action of normal valves. Functional murmurs due to leakage at the mitral orifice are, therefore, systolic in time and are heard in the mitral area and at the apex; those at the tricuspid orifice, systolic in time and heard under the sternum; those at the aortic and pulmonary orifices, diastolic in time and heard in the appropriate locations. Functional murmurs are often associated with blowing sounds over the great veins of the neck. These are usually systolic in time, but may be almost continuous. They are especially common when there is anemia. It is not probable that either the murmur over the heart or the blowing sound in the neck are due directly to the anemia, that is, to any change in the blood itself. They are simply manifestations of the lowered muscular and nervous tone produced by the anemia. The cardiac muscle and the nerves controlling the heart are affected, like other muscles and nerves, in disturbances of nutrition. Such disturbances are especially likely to occur at or a little before puberty. At this time, moreover, as the heart does not increase in size as rapidly as the body, it is less able to meet the demands made upon it. Its walls and orifices not infrequently yield a little to the strain, and murmurs develop.

There is nothing about the character of functional murmurs which serves to distinguish them from organic murmurs. Either may be short or long, faint or loud, transmitted or localized. When murmurs are functional, the heart may or may not be of normal size, according to whether the leakage is due chiefly to incoördination of the valves or to dilatation of orifices as the result of a general dilatation of the heart wall. If the murmur is systolic, the cardiac area normal, the first sound of good strength, and there is no accentuation of the second pulmonic sound, the murmur must be functional, because, if the leakage is due to an organic lesion, the extra work thrown upon the right ventricle, even if it does not cause enough hypertrophy to increase the cardiac area, will necessarily increase its strength enough to accentuate the second pulmonic sound. If the cardiac area is increased, the first sound strong, and the second pulmonic sound accentuated, it is evident that the murmur is not functional but is due to an organic lesion at the mitral orifice, which is compensated for by hypertrophy of the right ventricle. If the cardiac area is increased, the first sound of fair strength, the second pulmonic sound normal, and there are no evidences of failure of compensation, the murmur is almost always functional, because, if it is due to an organic lesion at the mitral orifice, the enlargement of the cardiac area must be due to failure of compensation on the part of the right ventricle, which will necessarily result in a weakening of the second pulmonic sound and systemic evidences of failure of compensation. The presence of a blowing sound over the vessels of the neck always counts in favor of a functional murmur.

If the murmur is diastolic and in the aortic area, it is almost certainly functional if there is no enlargement of the cardiac area, because organic, aortic insufficiency is usually due to a serious lesion and causes enlargement of the left ventricle. If there is enlargement of the cardiac area, the chances are that the murmur is organic, unless there is marked anemia. If there is marked anemia, the murmur is almost always functional, even if it is accompanied by a Corrigan pulse, high pulse pressure, and a double murmur in the groins.

ORGANIC MURMURS

In general, a precordial murmur in an infant, unless plainly due to a congenital lesion, is not organic. It is not likely to be before a child is four or five years old. If a precordial murmur is due to an organic lesion there must be some enlargement of the cardiac area or, at the least, if the lesion is at the mitral orifice, accentuation of the second pulmonic sound. If the lesion is at the mitral orifice and there is compensatory hypertrophy, the second pulmonic sound is accentuated; if there is dilatation, the second pulmonic sound is weakened and there are evidences of failure of compensation. If the lesion is at the aortic orifice there is always enlargement of the cardiac area with or without evidences of failure of compensation of the left ventricle. Intracardiac diastolic murmurs at the mitral area and apex and systolic murmurs at the aortic area are always organic.

An organic, precordial murmur in the type of children under consideration means, of course, a permanent valvular or, better, a permanent orificial lesion of the heart. In occasional instances the lesion is overcome during the growth and development of the heart, but, as a rule, it is safe to say that it is permanent. A permanent orificial lesion in a child does not necessarily imply, however, early death or chronic invalidism. It may never cause any symptoms and may not shorten life by a day. The important things are not the murmur or the lesion of the orifice which causes it, but whether it is compensated or not, how much hypertrophy of the heart wall has been required to compensate for it, whether the cause of the lesion has been or can be removed, what sort of care the child can have, and what sort of a life it can lead.

If a child has an organic murmur, but the heart is only a little enlarged and the compensation is good, it is not only unnecessary to treat it as a cardiac invalid, but does it actual harm. It should be allowed to lead a normal life, except that it should be kept out of competitive athletics and should be guarded against excessive exertion. Even if the hypertrophy is greater, it is inadvisable, if compensation is good, to limit its activity too strictly. It should be allowed a reasonable amount of freedom. In all cases, however, the child should be kept under observation and all possible foci of infection removed.

Comment.—It is evident, therefore, that a precordial murmur in a child does not necessarily indicate that it has organic "heart disease." In fact, the chances are that it has not and that the murmur is due to some other cause and has no pathological significance. It is also evident that no examination of the heart is complete and that no conclusions are justified, unless the size of the heart, the character of the heart sounds, the intensity of the second pulmonic sound, the condition of the other organs, and that of the child as a whole, as well as the location and character of the murmur and how it is affected by respiration and position, are investigated. If all these points are taken into consideration, it is usually possible to determine whether a precordial murmur is organic or not, and, if it is, whether the lesion which causes it is a serious one or not.

DISCUSSION

Dr. William H. Robey, Boston: I have been very much interested in Dr. Morse's paper on heart murmurs in children because there is no more vital subject in medicine. It is very important to discover the meaning of a heart murmur in a child, because, as Sir James Mackenzie pointed out many years ago, a child's life may be spoiled and the family unduly worried, over a perfectly harmless heart murmur. To make a diagnosis of heart disease on a murmur alone is fallacious. There must be other indications, particularly in the circulation. With rest the majority of functional murmurs will disappear, while organic murmurs will become more intense. The reason for this is that in the first condition, there being no structural pathology, the strengthening of the muscle returns the valve action to normal, while with organic changes the strengthened muscle drives the blood through the damaged valve with more force. A child who can play without undue fatigue or digestive disturbance has generally purely functional murmurs, which can be disregarded. If you find that a child actually has an organic lesion, what are you going to do about it? You must be careful not to limit a child too much, but you may prescribe reasonable exercise, watching for the child's effort tolerance. It is better to allow occasional over-exertion than to repress the child too much. A sedentary life is always bad for compensated heart cases, whereas exercise improves the pulmonary circulation, the action of the skin and the digestion. The great trouble with prescribing exercises for organic cases is that we do not give sufficient instruction to the patient not to allow the exercises to be carried too far. There are still doctors who give digitalis as soon as they hear a heart murmur, but fortunately the number is becoming less.

DR. HENRY JACKSON, Boston: Thank you for asking me to say a few words. While he was in college and at the time one of the most noted as a rush in football, a young man was under my care; I found no evidence of organic heart disease, yet he had been prevented from taking part in children's sports on account of a supposed trouble with the heart.

I would like to mention one common cause for the diagnosis of heart trouble in children, namely, an irregularity of the rate of the heart beat, —sinus arrhythmia. In this form there is a gradual slowing and quickening of the rate, especially with respiration. This is the normal respiration of small animals and is very common in children; of no significance, yet often considered as indicating some abnormal type of heart action.

I would, with Dr. Morse, acknowledge that to me the third heart sound is not recognizable.

DR. PAUL DUDLEY WHITE, Boston: Dr. Morse's paper I believe to be very good and clear, and I have practically no difference of opinion. We have at the Massachusetts General Hospital during the past two years studied the heart sounds in children who have had chorea or rheumatic fever. The third sound at the apex is quite frequently heard in normal children, especially when they are lying down and with the pulse slow. It resembles a late reduplication of the second sound, but there is a longer interval. Frequently in early mitral stenosis or early mitral disease there is a slight murmur following this third sound, but I am a little uncertain as to when that murmur begins to occur in mitral stenosis. I want to follow for ten or twenty years cases we are seeing now. Two or three days ago Dr. Cabot asked me whether I felt that this early diastolic murmur always means mitral stenosis. I said I was not sure whether sometimes only the third sound is audible or whether it is prolonged to a short diastolic murmur. I feel quite certain that Mackenzie is wrong when he says that the first sign of mitral stenosis is a presystolic murmur. The first sign of mitral stenosis is the "mid-diastolic" murmur. In my experience I have not heard a late diastolic or presystolic murmur without a middiastolic murmur first. I am very much interested to know what Dr. Morse thinks of this diastolic murmur. When one hears a very loud third sound at the lower end of the sternum one should suspect mitral stenosis. But the murmur that follows this third sound may not be audible until one approaches the apex from the sternum. Then the diastolic roll appears. And it may not be heard sitting up, that is, the slight diastolic roll. I find that I have to listen to the heart with the child recumbent before I hear this roll sometimes. Mitral stenosis may easily be missed.

I think Dr. Morse is quite right when he says that there is no perfectly certain distinction between organic and "functional" apical systolic murmurs. It is true that the louder the murmur the more likely it is to be organic. The louder the murmur the further the transmission.

I have also been interested in the reduplication of the pulmonic second sound. It is well pronounced with the patient recumbent and in full expiration. Possibly the pulmonic valves then close earlier than the aortic. There is a tendency for the second pulmonic sound to be especially reduplicated in mitral stenosis, the reduplication being due to an increase of pulmonary circulatory pressure.

I would like to ask Dr. Morse whether he thinks the Graham-Steele murmur, that is, the functional pulmonic regurgitant murmur, occurs in children. In adults very rarely with marked stenosis and increased intrapulmonary pressure there may occur this murmur of functional pulmonary regurgitation. It is said to be extremely rare, and most so-called Graham-Steele murmurs prove to be organic.

Dr. Morse spoke of functional aortic regurgitation in children. It occurs in adults very rarely, and I asked the members of the Cardiac Clinic Association in New York two years ago how often they had heard the functional aortic regurgitation murmur. They had heard the diastolic murmur of functional aortic regurgitation in only a few isolated cases in adults. It has not been generally known that it occurs in children.

I should also like to ask Dr. Morse if he thinks aortic regurgitation is less serious than mitral stenosis in a child. It has been my experience that in adults with rheumatic heart disease a slight to moderate degree of aortic regurgitation affords a better prognosis than a similar degree of mitral stenosis.

Dr. Morse (closing): My experience leads me to believe that mitral stenosis is not a common condition in childhood. Clinically it is certainly most uncommon, and pathologically I have seldom seen it. I do not remember of ever having heard of the Graham-Steele murmur. I do not recognize it now that I have heard of it, consequently, I think it must be most unusual in children. A functional diastolic aortic murmur is, however, not at all uncommon in infancy and early childhood, especially when there is anemia. In such cases there is also a pistol shot and a double murmur in the groins. The reason that I am sure that this murmur is functional is because I have seen it come and go in the same child, according to the severity of the anemia at the given time. I do not know anything about the relative prognosis in aortic regurgitations and mitral stenosis in childhood. In my experience both of them are very rare.

I can match Dr. Jackson's story as to the football player. I saw a small boy develop endocarditis with mitral insufficiency with scarlet fever and watched him for a number of years. The last time I saw him he still had a murmur and his heart was a little enlarged. The next time I saw him he was one of the most famous quarterbacks on the Harvard team.

THE TREATMENT OF WHOOPING-COUGH IN PRIVATE PRACTICE

By William W. McKibben, M.D., Worcester, Mass.

A box manufacturer living in the thickly populated "Assyrian Quarter" maintains that there are more children living on Wall street, Worcester, than in the whole residential "West Side Proper"; investigation proved this to be true. In February, 1919, an extensive epidemic of pertussis began to run riot on this one mile of street. An excellent opportunity presented itself to test out the relative value of plain and combined vaccines, preventive and curative treatments; the initial and subsequent doses, how often and how many; the best site of injections; what local or constitutional reactions, and the best manufacturers of vaccines.

The value of other therapeutic measures was tabulated; this included drugs and dosage, abdominal supports, hygienic and dietary treatment, inhalations and local applications. Notes were kept as to how soon the appetite returned, if lost; how early the paroxysms were reduced to one or two mild attacks at night and how soon the vomiting, whooping and spasms of coughing cease altogether, leaving only a mild catarrhal cough controlled by cod liver oil and the usual constructive measures such as proper quantity and quality of food—including an actual prescription for a quart of certified milk from the dairy or clean milk station; and a barrel of sand from the sand and gravel man—to encourage long hours in the sun; also the proper care and use of the teeth; regular meals with no tea or coffee, nor any sweets between meals; frequent bathing, daily defecation, and early to bed, with windows open.

In this 1919 epidemic the writer was first called to a "three decker" containing 29 children—ten in the basement, seven on the first floor, eight on the second, and four on the third. Most of these children had advanced to the beginning of the paroxysmal stage. The epidemic spread to the Italians at the foot of Norfolk street, who carried it to the main body of Italians on Shrewsbury street. From here, as did the influenza epidemic, it spread to all the various nationalities of the city. Before the end of the summer it had reached the children of the well-to-do West Side, where the chances of segregation and re-infection were much less. The result of treatment was even more striking here than in the crowded tenement districts, as intelligent co-operation could be much better carried out. However, as always where the treatment is inaugurated in the advanced paroxysmal stage, seven per cent. gave disappointing results, occasionally among friends or relatives even, where convalescence was tedious; four cases necessitated a sojourn at the Florida beaches, where they eventually did well.

Having learned from three years' experience that no ill effects would follow the use of plain vaccine at all, at first this was chosen for the ordinary case, with the definite purpose in mind of using large doses, both in prophylactic and early curative treatments.

P. Luttinger (*Jour. Amer. Med. Assoc.*, May 19, 1917) wrote that the results obtained at a whooping-cough clinic, and by over 180 private physicians and health officers, made him believe the routine administration of pertussis vaccine to be of value in both curative and prophylactic purposes. E. J. Huenckens (*Amer. Jour. Dis. Children,* Oct., 1917) treated 17 healthy children with pertussis vaccine to study its effect on antibody formation by means of the complement-fixation test. He concluded that it is possible to immunize children against pertussis if sufficiently large doses of freshly prepared vaccines are used. W. M. Gray (*Practitioner*, Jan., 1918) found decided improvement in cases treated with plain stock vaccine, except feeble infants too weak to give other than a negative reaction. Dr. Chas. G. Kerley ("Practice of Pediatrics," 1918 edition) had satisfactory results in 28 out of every 30 cases treated by giving large dosage of the plain vaccine.

As time brought more experience, however, mixed vaccines were used with the same confidence; as these were simply dead centrifugalized bacilli washed off with physiologic salt solution, there was no danger of anaphylactic shock or serum sickness as in the use of diphtheria antitoxin, for example; consequently no cutaneous tests nor graded immunizing doses were necessary. The combined vaccines containing B. pertussis and influenzae, streptococci, pneumococci, staphylococci (aureus and albus) and micrococci catarrhalis were reserved for those cases with complications, those of long duration, or the 7 per cent. resisting the plain vaccine. However, it was found that frequently large doses of the plain cleared up complicating bronchitis or broncho-pneumonia, the reduction of the virulency of the B. pertussis seeming to be sufficient to discourage the growth of secondary organisms. This was accomplished by establishing an immunity against the B. pertussis by the tissues locally at the site of the killed germ injection first; being dead, these microorganisms could not destroy tissue nor multiply, but instead stimulated the tissues to produce protective ferments, which process continued even after the germs disappeared. By means of the blood stream these antibodies were carried throughout the system. Thus resistance was offered to further invasion of both the primary and secondary offenders. Consequently the rapidity of cure of a case depends on the celerity with which it will immunize, some cases in one day, some in the second or third week,

Serologic tests were conducted by Luigi Auricchio of Rome (*Policlinico*, Jan., 1923) with a view to determining experimentally the immunizing properties of the children's serum. These tests were conducted on 10 children, picked at random in the clinic, who had never had whooping-cough. Vaccination was performed with the same material and in the same manner as in the prophylactic tests described later. Search for specific antibodies was made before, during and after vaccination, both by complement-fixation tests and agglutination reactions. At the same time the opsonic index was determined. The antigen for the complement-fixation reaction was prepared by suspending on physiologic solution cultures of Bordet-Gengou baccili dead about 48 hours; this, after titration for anticomplemental power, was titrated and controlled with serum of normal children under two years of age, as well as with serum of children who had suffered from whooping-cough for over a month. The same cultures, appropriately diluted in physiologic salt solution, were made into bacterial emulsions to be used for agglutination tests. This same emulsion, considerably diluted, was employed to determine the opsonic index; the latter was lower in each instance before the administration of the vaccine than during and after vaccination.

These investigations showed that vaccinations were uniformly followed by the formation of specific antibodies and elevation of the opsonic index. The agglutinating properties of the peripheral blood serum became noticeable, on the average, 6-8 days following the first vaccine injection, reached their maximum 10-20 days following the last injection, and remained at this level for about a month, after which they began to diminish. The limits of agglutination reached were not very wide; for the most part they oscillated from 1:50 to 1:100, only one case showing an elevation of 1:200. Much more sensitive, although appearing relatively later, were the complement-fixation tests. There was obtained uniformly a gradual inhibition of hemolysis, first barely noticeable, between the tenth and fifteenth days following the first vaccine administration, but reaching its maximum intensity soon thereafter and maintaining itself at such point during the entire duration of the experiment. Opsonic index observations showed in each instance early and marked increase in phagocytic properties, reaching its maximum between the tenth and twentieth days following the first injection.

Auricchio prepares the vaccine fresh every 10 or 12 days from four different strains of Bordet-Gengou bacilli, two billion per c.c. Children under five years received three prophylactic intra-muscular injections on alternate days, four billion first and six billion the second and third; 38 out of 40 exposed escaped, the two probably already incubating.

The writer, in order to be sure to obtain fresh vaccine, made arrangement with one pharmacist alone to keep a 20 c.c. vial ahead. Dr. Sparrow and many other physician friends used the same druggist. In 1919 the vaccine used contained two billion pertussis bacilli per c.c., whereas now each c.c. represents four billion bacilli plain or five billion combined, which the writer is using almost altogether now in the present annual spring and early summer epidemic. It would be of value to know if pollenosis is an important etiological factor in producing this nervous spasmodic irritation coming with the blooming of plants annually.

As so frequently happens, measles precedes or follows the pertussis in many cases this year.

A 2 or 3 c.c. glass hypo syringe with a glass plunger is utilized; the needles are so small and sharp that, by pressing the skin apart with the thumb, fore and middle finger of the left hand until it is white, the injection can be given sleeping children without awakening them. From a full wide-mouthed bottle, carried by the physician, alcohol is drawn up to clean out the syringe, and a few droplets sprayed on the rubber diaphragm of the vaccine bottle; then sterile water from the tea-kettle is drawn into the syringe and ejected. After drawing air into the syringe the needle is plunged through the rubber mouthpiece and the required amount of vaccine drawn into the syringe from the inverted vaccine bottle. Although occasional tenderness, induration and small areas of discoloration appear at the site of the injection, if not plunged deeply into the gluteus maximus muscle, yet the writer has seen no infections or abscesses at all in over 5000 injections. At first an imaginary line was drawn from the great trochanter to the upper end of the inter-natal cleft and the injection made at about the middle of it, but owing to the nearness of the sciatic branch of the internal iliac artery this site was abandoned and the line was drawn from the crest of the ilium to the upper end of the natal fissure; the point selected was the junction of the inner and middle thirds; this was just too high to strike the gluteal branch of the internal iliac. Lying on its stomach face downwards, the fractious child, held on an adult's lap, could not get a purchase for the arms and legs. Any up-and-down motion of the nates is counteracted by both hands being held firmly pressed down, following the same motion, to avoid breaking off the needle in the gluteal muscle. The above technique was found to be the most expeditious in dealing with a large family or a neighborhood where prophylactic as well as curative treatment was carried out.

For prophylaxis, infants are treated the first day with one-half billion, the third day with one billion and the fifth day with two billion. Children require empirically twice this dosage as a preventive. Many cases were successfully given only two doses, but three are recommended, and even more if catarrhal symptoms have begun. As in immunizing with proteins in recurrent vomiting, hay fever, etc., the writer has worked on the principle suggested by Dr. Fritz Talbot that frequent injections at two or three day intervals desensitize or develop antibodies, whereas infrequent injections of ten days or two-week intervals increase the sensitization of the individual.

Through lack of knowledge or confidence some parents gave opportunity for not more than one or two treatments; the second physician called was told the injections did no good and went away with a fresh distrust of the vaccine, not taking into account the small dosage of the first injections, and the fact, as Auricchio proved experimentally, that immunization usually does not become established until from 10 days to three weeks; the second doctor called may have had a like experience himself, using the vaccine gingerly, having little confidence himself, therefore inspiring little.

It is important to give a treatment or two, at four or five-day intervals after the symptoms have subsided, to avoid a relapse. Children with large adenoids and tonsils, being catarrhal and having good culture media, as well as lower resistance, respond less readily; they are apt to have the twin or double paroxysms severely.

Recurrent attacks of pertussis, weeks, months, or years apart, are not so very uncommon either with or without the vaccine treatment. The writer's five-year-old daughter was exposed intimately and innocently seven times last year at about two-week intervals; eight prophylactic inoculations were successfully given; this year four infected kindergarten children out of a dozen were taken out of her room at school, and then instead of immunizing the rest, the room was closed for two or three weeks. Her immunity at the end of a year apparently still holds.

To prevent misunderstanding, it was explained to the mothers that pertussis vaccine, like smallpox vaccine did not "take" or begin to "work" until a week or ten days after inoculating; the condition was likened unto a house afire—first a few sparks easily controlled but later eating its way between the partitions and attacking the very vitals of the house; as in diphtheria, it was important to get ahead and keep ahead of the attacking hosts.

As stated, some cases required even more than six injections of the combined vaccines, as in the case of a girl of eight who was found on the first visit to have severe paroxysms with cyanosis and vomiting; she had no appetite nor could she retain scarcely any food; the diagnosis of pertussis, broncho-pneumonia, bronchiectasis and dilatation of the left ventricle to 3 c.m. to the left of mammary line, with a loud systolic murmur transmitted to the mid-axillary line, was confirmed by Dr. Albert Getchell of the staff of Rutland Sanitarium and the Worcester Tuberculosis Hospital. She coughed up foul green pus in mouthfuls and was the picture of distress and apprehension. Bromide was not tried for her insomnia on account of her sensitive stomach, and codeine seemed ineffective; antipyrin could not be used with safety. She was placed on an improvised sleeping porch, and the vaccine treatment started in trepidation; in this case the plain vaccine did not seem at first to help, so the combined was substituted with satisfactory results; the patient made a good recovery after prolonged rest on a couch on the veranda, and a course of iron and cod liver oil and dietary treatment. A cousin, a boy of nine, living two blocks away, had much the same condition without the bronchiectasis; his parents refused to allow the vaccine to be given; his physicians prescribed various cough syrups; the case had a fatal termination.

The fresh-air treatment has been insisted upon, except in cold, wintry weather; if the child could not go to a cottage at the beach, the beach was brought to him in the shape of a sand pile in the sun to attract him out of doors. The weather permitting, the window of his sleeping room was kept open as far as practical without a draft. Fresh air on cold nights invariably makes infants cough more frequently and severely. Two pillows were used, and a different room for alternate nights.

The contradictory results reported by various observers have been due principally to three reasons: first, there are apparently four different strains of the Bordet-Gengou bacillus which, if possible, should be included in every vaccine; secondly, that small doses have been used because of an unwarranted fear of a reaction; and third, the vaccine should be comparatively freshly made.

The initial therapeutic dose for children was one billion, and in two days it was increased to two billion, and in another two days to four billion. The fourth and often the last dose was 5 or 6 billion, repeated once or twice at two or three-day intervals, if necessary. Infants, except very weak ones, were given just half the above dosage. Rarely there was a rise in temperature and some general discomfort, necessitating the same or a diminution of the amount the next time.

As greater experience proved no injurious effects from large doses, the fifth and sixth reached even 8 or 10 billion in older children. The writer has occasionally given seven or eight treatments to cases responding poorly; it goes without saying that it was first necessary to believe thoroughly that convalescence would be eventually much shortened and satisfactorily free from complications and sequelae, in order to make the sometimes doubting parents believe it; but at times, just as the crew was about to mutiny and throw Columbus overboard, along came the welcome bird bearing an olive branch in its mouth, so suddenly and rapidly did the symptoms ameliorate when immunity was once fully established.

A thorough explanation was offered the parents in the beginning as to the harmlessness of the treatments, and of the frequent disappointment after the small dosage of the first, second or even third injections, but that the amount given rapidly increased or even doubled with each treatment so that often you not only held the disease in abeyance, but even gained on it after the third and fourth puncture.

The mother was frankly told that in the first week of treatment if her child was getting worse it probably would continue to get worse even with the vaccine; but the second week it would obtain its maximum intensity and come to a halt just as she was getting discouraged; the third week there was usually a decided and sudden change for the better, after the symptoms had been temporarily exaggerated by the vaccine.

As time went on, the writer felt more confidence in promising three things from the treatments: first, that the number and severity of the paroxysms would ordinarily steadily decrease after the third or fourth injection when the maximum dosage and symptoms were approached; second, that the ultimate duration of the disease would be reduced from two or three months to three or four weeks, the greater part of the time the little patients maintaining good nutrition and good sleep—it being a fact that when these two features obtain, the parents take a more optimistic view of the case; third, that the chances of dangerous complications, such as bronchitis, broncho-pneumonia, emaciation, tuberculosis, emphysema, asthma and cardiac dilatation, are exceedingly improbable, the writer in over 1000 tabulated cases having had only two pulmonary cases develop after he had started treatment, one of these making satisfactory recovery after one week's duration.

These three factors are certainly worthy of consideration when one remembers that the friends were wont in 1919 to tell the distracted parents that "nothing could be done for whooping-cough," except the vapo-cresolene lamp, the gas-house, whooping-cough plasters, embrocations, charms tied around the neck, and certain proprietary remedies that increased the gastric irritability. The writer has yet to see in the above vaccine cases the old picture of hemorrhages into the brain, as well as from the nose, ears or mouth. Even a mild epistaxis is becoming uncommon in the early treated cases, as is the puffiness under the eyes.

The writer has had the most satisfactory results in treating infants not only to prevent, after exposure, but also particularly after the paroxysms have begun. They respond more quickly to the vaccine than do older children; even if non-tubercular broncho-pneumonia has already developed, the chances of success are by no means practically hopeless as under the old treatment where drug therapy only increased vomiting and excited them into another spasm.

The answer to the expression, "So long as they have to have it, why not let them have it and get it over with," is in Dr. John Morse's presidential address at the Annual Meeting of the American Pediatric Society, Washington,

1913. He stated that 94½% of the 6,324 deaths from whooping-cough in the United States in 1906 was in the first five years; 57% in the first year, 23% in the second, 8% in the third, 4% in the fourth, and 2.5% in the fifth year; that it is a comparatively mild affection in healthy children over five, and after puberty rarely fatal; that 32% died in North Carolina in 1911 against 11.4% for the whole United States; that surprisingly little had been done to check the death rate, in notification, isolation or disinfection; that there is almost no provision for hospital treatment except "on the sidewalk" at the end of the clinic; yet there are 10,000 or more deaths yearly in the United States now.

In spite of the fact that Bordet and Gengou began investigating whooping-cough in 1896, announced the finding of the Bacillus pertussis in 1906, that the four points of specificity of Koch were demonstrated in 1908, and that biologic therapy began in 1909, the mortality and incidence is on the increase, 100,000 children dying in the United States in the last ten years. This is partly due to the fact that comparatively few general practitioners have as yet begun to use the vaccine.

Pertussis is most contagious during the catarrhal and early spasmodic stage through the sputum; spreads mostly through the droplets in coughing and sneezing and moist hands in contact with door knobs, desks, pencils, slates, etc.; is contagious until all paroxysms have ceased, as long as the sputum is positive.

Considering the fact that pediatricians, with rare exceptions, believe heartily in vaccines as a prevention, it would seem wise to send home any catarrhal suspects from school, treating with three or more inoculations not only them, but also all those exposed at school and home. The use of bands on the arms, placards for doors, cottage hospitals, examinations of sputum, education of both physician and laity in the best prophylaxis and therapy would all tend to markedly reduce unappreciated mortality.

Granting that preventive vaccine treatment gives best results, curative in the catarrhal stage next, and that the results in the paroxysmal stage are delayed, but striking, nevertheless, in a large series of cases, it is often inadvisable to wait until absolutely sure of the diagnosis before giving the vaccine because much valuable time in beginning the treatment is lost.

Edwin A. Riesenfeld (*Jour. Amer. Med. Assoc.*, Jan. 20, 1923) injected intracutaneously into children who had pertussis, into those immune, and into still others who developed the disease after injection, various preparations of Bordet-Gengou bacilli. The author hoped that the subsequent reaction at the site of the injection might be of value in diagnosing whooping-cough in its early stage, or might reveal an actual or acquired immunity. The specific reaction obtained by Schick with diphtheria toxin was taken as the standard of comparison. No specific reactions were obtained, however, with the various preparations, and both positive and negative results were observed in each of the three groups of children.

The writer personally has not found it practicable in home treatments to diagnose pertussis from agglutination, from complement fixation, from the sputum smears, from cultures, from a differential count, from a leucocytosis (average 20,000), lymphocytosis (average 70%) nor from the protein test with the B. pertussis. Whooping-cough cases are not encouraged nor allowed to come to the office.

However, the history of exposure and environment, and the character of the increasing cough (chiefly at night without fever or physical signs) when actually seen and heard by the observer, are usually unmistakable. All doubt is removed by paroxysms, suffusion of face and vomiting. The occasional confusion with an influenza paroxysm is an argument put forth in favor of the mixed vaccine, to which we are no doubt leaning more and more; this is particularly true as we find very little more untoward reactions from the mixed than we do from the plain. The writer has just received a letter in which its author stated that the first case he treated with mixed vaccine was accidentally given ten times the advised dose. There was no reaction, and the child who was already whooping stopped his paroxysms five weeks before his contact case.

In some cases where the paroxysms were severe and frequent and the loss of sleep great—some little patients having as many as thirty coughing spells in one night—until the vaccine reacted, drugs were resorted to as a temporary adjunct; this was not until they were absolutely required at the height of the paroxysmal stage, as the writer does not believe that they influence the eventual duration of the disease one iota.

Euquinine as an antispasmodic has been most helpful in doses of ten to twenty grains a day, a total of six doses being given to a child two to six years of age, at two-hour intervals. It is ordinarily inadvisable to upset children with cough syrups, particularly as the stomach is already bad, and unless a mixture is agreeable, a struggle and violent coughing results; however, two grains of euquinine to one drachm of syrup of tolu, if properly compounded, is not at all bitter when taken; it is relished by most babies and children, increasing rather than diminishing the appetite.

In preparation for the night the writer has found the following gunshot tablet useful, given at half-hour intervals beginning two hours before bedtime: acetanilid one-half gr., tr. drosera 1 min., belladonna one four hundredth gr., ipecac powd. one two hundredth gr.; antipyrin in one-half to two gr. doses, best combined with sodium bromide in two to five gr. compressed tablet form, or with the syrup of raspberry and considerable water, is, in the consensus of opinion of the several hundred pediatricians returning questionnaires, the most valuable of all drugs.

Steam inhalations, with compound tincture of benzoin or creosote on the inverted flatiron or other electric heater, are helpful where the cough is dry and croupy, or in bronchitis and broncho-penumonia, incidentally using warm rather than cold, dry air.

Codeine gr. one-sixth to one-fifth in children 5 to 12 years, given at bedtime and repeated once or twice in the night, is used to combat the wakefulness after other means fail. Pertussin is much prescribed by the family physician and, for a syrup, is well retained and palatable; it has a considerable reputation among druggists and the laity. T. E. McMurray (*N. Y. Med. Jour.*, July 24, 1920) says he obtained satisfactory and immediate results by the use of benzyl benzoate. The dose was 5 to 30 minims every four hours, depending on results. There were no undesirable gastric or other symptoms.

Dr. D. I. Macht (*Bulletin of the Johns Hopkins Hospital,* July, 1920) found that 20% benzyl benzoate, with 5% alcoholic sol. of benzaldehyde, with milk and water produced marked amelioration in the number and violence of the paroxysms; it acted as an anaesthetic on the nerve terminals in the larynx, an expectorant, a bronchodilator, and a mild sedative on the respiratory center; the average dose is 30 to 40 drops.

The writer has used calcium iodide gr. one-third, also elixir benzyl benzoate, benzylets, solution and globules of benzyl benzoate, benzyl succinate, and esterol but, as with most drugs, the action has not been constant or reliable.

Full ~~doses of~~ belladonna, gradually increasing to the point of dilated pupils, and the blush, have been found in the hands of some excellent observers to have a decided effect on the severity and frequency of the paroxysms. The initial dose to a two-year infant is atropin gr. one five-hundredth, or one-quarter minim of the fluid extract every four hours, pushing up to the physiological effect. However, in sixty severe institutional cases Dr. Charles G. Kerley found it disappointing. Chloroform may be given for the convulsions but, personally, the writer has not been forced to use it since he began using the vaccine in 1916. Topical applications of cocaine or silver nitrate to the larynx or pharynx are inadvisable. Syrup of ipecac was of great value in 3 to 5 minim doses in the treatment of a five-weeks infant apparently moribund; the paroxysms, followed by convulsions, were so frequent that it appeared to be in a state of tetany; respirations were interrupted by such long intervals that death seemed imminent; his jaw was drawn forward as in ether cases. Oil of eucalyptus and tinc. benzoin comp. steam inhalations were used constantly. The infant had one-half billion plain pertussis vaccine the first day, three-quarters billion the second and fourth days; the tenth day he was nursing and sleeping well and the paroxysms had disappeared.

M. Vargas (*Zeitschr. f. Kinderhlk.,* Dec., 1921) discusses cases in which syncope and apparent death occur during paroxysms, not caused by convulsions, asphyxia, laryngospasm or glottis edema, and explains it on the basis of stimulation of the vagus fibers inhibiting the heart by the sensory nerves of the larynx; expectorants should be administered for this type of case, also dionin and chloral hydrate and intramuscular injections of ether. Auto vaccines may be employed.

Kurt Achsenius (*Monatschr. f. Kinderhlk.,* Leipsic, Oct., 1922) refutes the interpretation that his silver nitrate treatment is of purely suggestive value, because it is successful in infants; the paroxysm is caused by contact of mucus with the membrane, which excites the cough reflex. Silver nitrate inhibits secretion and acts as a deterrent. The author gives up to three insufflations of anesthesia each day via nasopharynx, preceded by instillation of 2% colloidal silver drops, and by painting with silver nitrate solution. In 870 cases the mortality was less than 1%.

Weil and Dupur introduced the method of giving ether intramuscularly in 1914, in ½ c.c. doses in infants; older children, 1 c.c. Variot and Audrain had both good and poor results with it. Joseph Castoria (Pediatria, Naples, Feb. 1, 1923) claims satisfactory results in 96 out of 100 cases by using 0.5 c.c. of ether in infants and 1 c.c. with children, injected intramuscularly in the gluteal region; redness but no necrosis occurs locally sometimes. It may act as an antispasmodic or may exert a bacterial effect, being eliminated by the lungs. J. Ginsburg (*Polskagazlek.,* Cracow, March 6, 1923) thinks ether a specific.

Sheffield found the vaccine valuable in immunizing new-born babies, but as a therapeutic agent it was useless in six cases; he advised isolation at once even from a nursing mother, and the use of bromide with lime and soda hypophosphites as in spasmophilia, which the paroxysms resemble. Méry and Girard at Paris in February, 1923, successfully treated a 2-months old infant having 30-40 whoops a day with 5 and 10 c.c. of the mother's citrated blood, as in convalescent measles and scarlet fever. The mother was just convalescing from pertussis. Lesne and Petot (*Bull. et mem. Soc. Méd. d. hôp. de Paris,* March 8, 1923) injected intramuscularly the blood of convalescents, but found it did not modify the intensity nor duration of the whoops. However, it had an excellent influence on the general condition and broncho-pneumonia, whereas the blood of children not recently having pertussis had no such result. Robert Debré (*Bull. et mem. Soc. Méd. d. hôp. de Paris,* March 13, 1923) found that 31 out of 40 children were completely protected by 2-3 c.c. of serum taken from the fourth-week cases; the fourth week was selected because the blood then contains the greatest amounts of specific amboceptors. G. R. Davies (*Amer. Jour. Dis. Child.,* May, 1922) reports that 33 out of 176 children, exposed in the Syracuse State School for mentally defectives, developed pertussis; the remaining 143 children were given prophylactic doses of vaccine regardless of previous records or histories. Only four came down, and they had mild, uncomplicated attacks. Gottlieb and Möller (*Jahrb. f. Kinderhlk.,* Berlin, Dec., 1922), after describing the inflation of the lungs and tympany, offer nothing except sedatives, hypnotics, opiates, hot baths, and feeding in the treatment; also lumbar puncture for temporary relief of the convulsions; they discredit Birk and Czerny as giving a warning against the use of vaccines; in an epidemic of 200 children, 30% died, vaccines not being used at all.

In a series of 342 whooping-cough patients not treated with vaccine, ranging in age from early infancy to 12 years, F. Reiche (*Zeitschr. f. Kinderhlk.,* May, 1920) observed 29 cases with convulsions. Secondary infections accounted for all except 17, which were uncomplicated whooping-cough. All of the 29 cases terminated fatally.

Freud and Rie point out that many cases of encephalitis were preceded very shortly by pertussis, and that cerebral and spinal hemorrhages are not infrequent complications.

Henry I. Bowditch and Ralph D. Leonard (Boston Med. and Surg. Jour., March 8, 1923) make a preliminary report of 26 cases treated by the x-ray; the ages, from 3 months to 43 years, were in all stages of active pertussis (1-10 weeks). Each patient received three or four applications of the rays at two or three-day intervals, the dosage according to age, but well under an erythema dose. Many of the patients had not been observed sufficiently long for final result, but definite improvement resulted, which cannot be accounted for by mere accident. No rational explanation of action was offered. A small percentage could be classed as prompt cures, as the spasms and whoops entirely disappeared after two or three applications. The majority of the patients, perhaps 70%, were relieved; 10-15% were apparently not relieved. The authors believe that the x-rays may be of more value than any other form of therapy, including serum, but further careful scientific study of such cases is needed. In a letter under date of April 20, 1923, Dr. Bowditch writes: "We all feel babies are much relieved; the other types, the late ones (10-12 weeks) are cleaned up most rapidly (1-3 days); vaccine does good and both will also help; I sort of combine the two; the other things as our common sense answers—air, food, restraint, possibly 'Benzylets,' but we must see."

Dr. Philip Cook of Worcester furnished a résumé of six cases he recently treated with x-ray:

Case 1. Aged 2. Two weeks' duration. About 20 paroxysms daily with vomiting and disturbed sleep. Three treatments on April 25, May 2 and 19. Little relieved at time of last treatment, and no report since.

Case 2. F., aged 4. One week's duration. Six to eight paroxysms daily. One treatment on May 2. Report, May 19, "Never whooped again."

Case 3. Adult. Mother of Cases 1 and 2. Just beginning to whoop. One treatment May 19. No report since.

Case 4. F., aged 3. One week's duration. Twelve paroxysms daily. Treated May 15, 22, June 7. Little relief till after second treatment. Now has only occasional paroxysm, no vomiting, appetite returning.

Case 5. F., aged 5. One week's duration. Ten to twelve paroxysms daily. One treatment on May 29. Reported on June 5 so far relieved that further treatment considered unnecessary. This patient had also two inoculations, one before x-ray treatment, other two days after.

Case 6. M., aged 5. Three weeks' duration. Twelve to fifteen paroxysms daily. Treatment June 1 and 8. Reports, June 7, that intensity of whoops is lessened for few days, and June 16, four milds attacks a day.

Dr. Cook says: "My impression is that the method, while still experimental, is worth a further trial."

The criticism has been advanced that, whereas one weak application for diagnostic purposes is justifiable, it is very unwise to apply repeated x-ray applications over the glands of an infant or child with resulting atrophy of the glands, such as the thymus and thyroid. Both Drs. Leonard and Cook answer this by saying that, compared to the dosage used to reduce the size of the glands intentionally, the applications used in pertussis are so weak they cannot possibly do any harm. Working by the law of inverse squares, where it would take, for example, three doses at ten inches without a filter to produce an erythema, in whooping-cough one four-minute application is made at a distance of 28 inches with a 1 mm. filter, which is one-ninth the preceding dosage.

When all is said and done, drugs are entirely useless as a prevention of pertussis, and of very questionable value in even alleviating the symptoms; the more years of experience one has with whooping-cough vaccine, the more skeptical he becomes of drug therapy and, finally, is inclined to ignore it almost altogether. Pfaundler and Schlossman in the edition of 1912, after enumerating 53 different drugs recommended, say: "The therapy of pertussis nowadays rests on mere empiricism. Drug treatment has at its disposal an arsenal of means that increases from one day to another. Theoretical considerations, advertisements, a personal liking for a certain remedy, etc., are frequently the determining factors that bring the high-sounding recommendations accompanying the latest drug."

Appel and Bloom (*Archives of Pediatrics*, April, 1922), in an excellent paper read before the Eastern Medical Society, May 13, 1921, approach the subject of pertussis therapy from the angle of institutional experience largely, whereas the present writer deals with it wholly from the viewpoint of private practice. In conclusion they say:

"In a disease so dreadful as whooping-cough and so fatal in its immediate, and so disastrous in its late consequences, whose etiology and epidemiology are known, and yet whose mortality is constantly on the increase and against which all methods have heretofore proven of so little use, any new means of combating it is worthy of all serious consideration, especially when such means is logical and founded on etiologic grounds. We say 'logical,' because we believe that the giving of vaccines in an acute febrile disease, such as pneumonia or erysipelas, is not to be encouraged, since it is but adding insult to a system already overburdened by a similar poison, and which has not had a chance to accommodate itself to the new condition."

"In a low-grade toxemia, however, such as whooping-cough, the injection of the vaccine will throw the balance in favor of the body, as is clearly demonstrated by the fact that after the third and fourth injections there is an aggravation of the clinical picture; which at the same time gives an impetus to the further production of the antibodies and, from then on, the body is able to take care of itself and improvement is noted. Such a means we have in whooping-cough vaccine. In those cases where it has failed to give satisfaction, it is probable that the strain of organism used in the vaccine was different from that producing the disease, or that a mixed vaccine was not used, since secondary invaders are always present with the pertussis bacillus, or that an inert vaccine was used or the dosage not sufficiently large. In the closing paragraph of the Weekly Bulletin of the New York City Health Department for November 6, 1920, the Department urges the prophylactic inoculations of children in institutions, and states that it may mean the saving of many lives, and that the reaction to the vaccine is negligible; while health authorities of other cities advocate the use of mixed vaccine both for prophylaxis, and especially for treatment. The average duration of the disease, as given by authorities, is from 45 to 100 days; with vaccines, the duration has been cut down to about 30 days, the severity has been mitigated, complications prevented, and mortality reduced. Should its prophylaxis and cures be far from 100 per cent., any remedy that accomplishes all the above is a better remedy than any that has hitherto been put forward, and should be used. Pertussis vaccine has done all this, and has, therefore, established itself as a definite scientific entity of almost, if not actual, specific value in the treatment of whooping-cough."

A month ago questionnaires were sent out to all the members of the New England Pediatric Society as well as to many other physicians throughout the United States. General practitioners and inactive pediatricians had had little or no experience with the pertussis vaccine. The answers from the men in active pediatric practice follow:

The results with preventive vaccine showed about 95% efficiency.

Sixty-six per cent. used plain vaccine for prophylaxis because it gives less local and general reaction. Thirty-four per cent. used the combined for prevention, with equally good results except for the reaction. The results with curative vaccine treatment:

The appetite in the catarrhal stage did not usually disappear, but did in the paroxysmal stage and returned in three weeks on both plain and combined vaccines.

The vomiting, whooping, and paroxysms disappeared in 50 per cent. in three or four weeks, 30% in four to six weeks, and 20% got little benefit except freedom from complications and mortality. The mixed gave better results than the plain in the paroxysmal stage: Reduced to two mild attacks at night in three to four weeks; initial dose averaged .2 c.c.; subsequent doses increased gradually in four injections up to 1 c.c. (four billion plain, five billion mixed); average number preventive doses was three; average number of curative doses was five; average frequency every three days.

Two manufacturers ran an even race for first place, and two likewise for the second. The gluteus maximus were chosen most often for site of injection, the deltoid second and the subscapular region third.

. Very rarely fever, or a slight local reaction, was reported. Antipyrin ½ to 2 grains and bromide 3 to 5 grains were the most used drugs. Few had any experience with x-ray therapy. All used the usual hygienic measures, abdominal support for vomiting, with food in small amounts at frequent intervals, particularly after vomiting. Topical applications to mucous membrane or chest were rarely used. Inhalations were prescribed with complicating respiratory trouble.

The writer believes that larger doses of fresh vaccine at more frequent intervals will reduce the above results in the paroxysmal stage by one or two weeks; that the number of cases unsatisfactorily responding to the vaccine will diminish to about 7%; and, finally, complications, sequelae and mortality can be reduced to less than 1%, or even to nil if the vaccine is used on exposure or in the early catarrhal stage.

If further study of the 350 cases under consideration at the On Shore Boston Floating Hospital at the present time shows no permanent ill effects from x-ray therapy, then this promises to take the place of the disappointing drug therapy now being utilized before the vaccine takes effect.

DISCUSSION.

Dr. H. I. Bowditch, Boston: I am very glad to have been here in order to assist the discussion on whooping-cough. The Boston Floating Hospital Staff have had a chance to put to a real test the x-ray treatment of that disease. They now, naturally, wish to speak a little, but will later go further into deeper reports.

We had approximately 350 cases, from four weeks on. We treated with the x-ray at intervals. The first exposure (the first day that the patient appeared) was given after physical examination, and an x-ray plate was taken for future work. The second treatment was given on the third day, or 48 hours after the first treatment; the third treatment on the fifth day, still 48 hours after the second treatment. If no further treatment was necessary, or desired, our treatment stopped. When more treatment was desired, we allowed seven days to go, that is, 12 days from the beginning, and then followed it up with the fifth or last exposure on the fourteenth day.

Exposure was taken as follows: We changed each time from anterior to posterior aspect of the chest, clothes on, so that there was no thermal danger, and the ray tube was 26 inches away. We used Filter A, and then gave 12 to 16 milliamperes from three to four minutes. Shorter treatments were given for children under eight months.

Our results in the majority of cases were as follows: Eight hours following exposure the cough became softer and less frequent, vomiting stopped, convulsions ceased, and the children slept. Sixteen hours later the cough returned, became more or less characteristic, while vomiting and convulsions did not reappear. Subsequent treatment had more or less the same effect. These remarks are general.

One or two months after treatment the mothers gave the x-ray exposure the mark of 75% to 100%. There were some who found no relief. There was no absolute cure.

In a word, this treatment should be used further. We seem to feel that associated with the vaccine we have two of the best arms of therapy. We are all interested in this old subject, rejuvenated.

Dr. K. G. Percy, Brookline: In adding a word to Dr. McKibben's paper, I wish to offer him praise for such a thorough piece of work. Whooping-cough is actually the worst infectious disease that ws have in infancy. The death rate, directly and indirectly, stands at the top of our contagious mortality list. Its numbers are diminished as the child's age increases. With the insidiousness of its onset, and our lack of a specific remedy, it has been the bugbear of the medical profession. Within the last few years it has undoubtedly become a disease which can be greatly helped, if not prevented, by the use of vaccine. I have been interested in this vaccine work for nine years, and I have come to the conclusion that it is an absolute preventative for a short period of years, at least. In looking over my records, I find that, among 280 cases given preventative vaccine, of those who have passed a three-year period, only three cases have developed whooping-cough from an exposure after vaccination. Thus, 1% among ordinary runabout and school children is far lower than would be a normal incidence. The first important question to arise is: "When shall vaccine be given?" I believe vaccine can abort a disease if given within a few days after exposure. I also agree with Dr. McKibben that, given in the early catarrhal stage, it ameliorates symptoms and shortens the disease; but I must be honest and state that I, personally, do not feel that it has but little or no value when given after the clinical diagnosis can be made. I believe that by studying the differential blood counts during the incubation period, that a definite diagnosis by relative and absolute mononuclear leucocytosis occurs in over 95% of all cases within the first 10 days of the catarrhal stage. This is followed by polynuclear leucocytosis, due to intercurrent infection of the mucous membrane. I believe that this procedure gives a more definite diagnosis and earlier beginning for vaccine therapy. In summary: From the practical point of view, I believe that the results of vaccine therapy depend upon the earliest possible diagnosis, and the earliest possible giving of vaccine.

I was much interested in Dr. Henry I. Bowditch's discussion of his results by the x-ray treatment of whooping-cough. I have watched with interest the results at the On Shore Boston Floating Hospital. Undoubtedly, in a high percentage of cases, there is a very marked amelioration of symptoms, but no apparent shortening of the disease.

I wonder, as do others, whether or not recurrent x-ray applications may not cause some permanent injury to the underlying glandular tissues. We know that x-ray applications to mice and guinea-pigs reduce their normal protection against tuberculosis. We know the action of the x-ray on the thymus glands and the lymphatic glands, and its probable action on the thyroid. Therefore, it is my belief, that unless a whooping-cough is so severe that the paroxysms must be relieved, and can only be relieved by x-ray, that it is wiser, for the present, not to use x-ray promiscuously in every case of whooping-cough.

I was sorry to hear Dr. Bowditch's statement that they have found no Bordet bacillus from any culture taken during the acute phase of whooping-cough. I cannot but believe that the Bordet bacillus is the etiological factor, if not *in toto,* at least in part, and I feel sure that our greatest hope in preventing whooping-cough is the administration of the Bordet bacillus vaccine.

Dr. George C. King, Fall River: I am sorry that as a member of the nominating committee it was necessary for me to miss the first part of Dr. McKibben's paper. However, I wish to second very heartily what I did hear.

I have been using pertussis vaccines for about six years, and I believe vaccines to be the only satisfactory method of treatment, and certainly the only method of prevention after exposure to the disease.

I wonder if Dr. McKibben mentioned the rather definite relief which most patients have after each injection, namely, that after six to eight hours they have a very severe coughing spell and raise a large amount of phlegm, and from that time on the coughing is less severe and less frequent. The vomiting is also lessened and in most instances stopped after the second injection. What I believe is most important, especially in infants, is that the patients that are inoculated do not have a complicating broncho-pneumonia. Of course the stage of the disease at which the vaccines are started has considerable bearing on the duration of that particular case, so I start treatment as early as possible.

To immunize I give two injections at three-day intervals, usually of the plain pertussis. I wish I knew how long the immunity lasts. I personally have had one patient whom I immunized as a baby, when his older brother had whooping-cough, contract the disease three and one-half years later when he went to school and was again exposed.

For treatment I give four injections at two-day intervals of the mixed vaccines. When results are not then obtained I do not believe it is worth while to continue because I believe that the results from the vaccines depend upon two definite factors: First, that the vaccines are fresh, as the fresher they are the more potent they are; and, second, that they contain the particular strain or strains present in that particular case.

Question from the floor: Whose vaccine do you use?

I rather hesitate to make statements in preference of one commercial house, but I do feel that I get better results from one kind and that is Sherman's combined No. 43. My dosage, I believe, is the same as Dr. McKibben's,—$\frac{1}{2}$ c.c., 1 c.c., $1\frac{1}{2}$ c.c., and 2 c.c.

I come from a cosmopolitan city where we have many epidemics, and when skeptical people, like the Portuguese, who are mortally afraid of the needle, call me, asking that "I stick the needle," because of the results that they have seen in their neighbors' children, I must feel that vaccines are well worth while.

Dr. McKibben (closing): Recognizing the fact that pertussis, like other infectious diseases, is self-limited and may run a mild course; yet its probable severity and tedious duration can be greatly modified; its treacherous complications and large mortality reduced practically to nil by the use of big doses of fresh vaccine, properly made, given in sufficiently large doses, sufficiently often.

Aerotherapy and dietetics are important; but up to the present time drug therapy, including even antipyrin, sodium bromide, and quinine, have been unsatisfactory and unreliable. Something should be found to take its place while the vaccine is establishing immunization.

Apparently, x-ray treatment is this heretofore unknown adjunct. Two careful and experienced roentgenologists, aforementioned, and Dr. Robert Hunt, for many years resident physician of the Boston Floating Hospital, believe that such small dosage, properly given, cannot possibly injure the child nor cause atrophy of its glands.

In his discussion, I hoped Dr. Bowditch would bring out the point that he made to me last evening and has not clearly emphasized today. This was to the effect that he still believes in vaccine therapy and feels, as I do, that x-ray, combined with vaccine, is the best treatment we possess at present for whooping-cough.

It is a fact, however, that the physician should have separate hours or separate offices for caring for his pertussis cases, or, what is still better, carry his vaccine and portable x-ray outfit in his auto from home to home.

FACTORS GOVERNING GAIN IN WEIGHT IN THE FIRST YEAR

BY FRED H. ALLEN, M.D., HOLYOKE, MASS.,

AND

EDWARD P. BAGG, JR., M.D., HOLYOKE, MASS.

[From the Child Welfare Commission, Holyoke, Mass.]

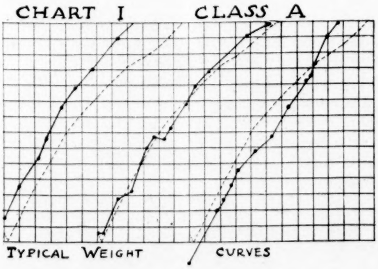
THIS paper presents a study of five hundred cases as observed at the Municipal Milk Station maintained by the Child Welfare Commission of the City of Holyoke, Mass., during the last five years. It is not the purpose of this paper to cover all the factors which influence the gain of weight, but merely to present at this time a few of the facts for which the records furnish sufficient data. If no new light is thrown upon a familiar problem, perhaps a little weight may be added to established beliefs. These five hundred cases have been taken from the regular clinical records since 1917. They are also taken in sequence, and include all cases where sufficient data were available. The mothers bring their babies to the weekly clinics for weighing and are given advice as to the care and feeding, by the station physicians. The weights are taken under the same conditions and by the same persons at that time. Further data are gathered in the homes by the visiting nurses at frequent intervals.

CLASSIFICATION

To permit accurate comparison, the cases are grouped in classes according to the weights at birth and rates of gain throughout the year.

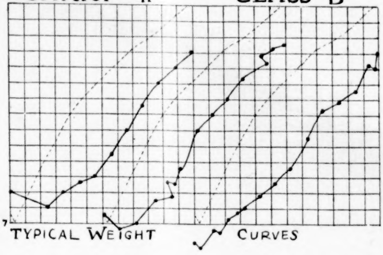
Class A. Includes all babies maintaining or exceeding the normal rate of gain, and reaching the normal weight during the year. (See Chart I.)

CHART I CLASS A



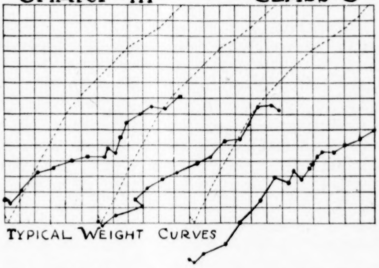
Class B. Includes all babies maintaining or slightly exceeding the normal rate of gain, but never reaching the normal average weight. (See Chart II.)

CHART II CLASS B



Class C. Includes all cases which fail to maintain the normal rate of gain, and remain below the normal weight. (See Chart III.)

CHART III CLASS C



These five hundred cases are distributed as follows:

Class A:	195 cases
Class B:	177 cases
Class C:	128 cases
Total	500

In other words, 372 cases, or 74.5 per cent., maintained or bettered the normal rate of gain, whereas 25.5 per cent. failed to do so.

We have taken for the so-called normal curve of gain in weight, without distinction as to race or sex, the following table:

Weight at birth: 7 lbs. 8 oz. (limits 7 to 8 lbs., inclusive.)
Weight at 3 mos., 12 lbs. 4 oz.
Weight at 6 mos., 16 lbs. 4 oz.
Weight at 9 mos., 18 lbs. 12 oz.
Weight at 1 yr., 21 lbs.

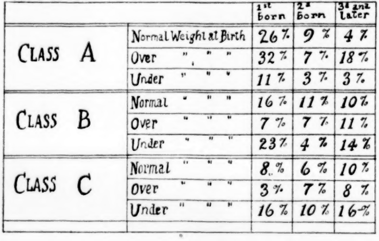
Grouping the cases on this basis gives the following information:

Cases: 248—7 to 8 lbs., inclusive
Cases: 141—over 8 lbs. to 12 lbs. 4 oz.
Cases: 111—under 7 lbs. to 2 lbs. 3 oz.

Total 500

Chart IV shows the relationship between babies that are of normal birth weight, those over normal and those below normal at birth; also grouping, according to Classes A, B, and C; and within these classes the sequence of the first born, second born, and third or later infants.

CHART IV



		1st born	2d Born	3d and later
CLASS A	Normal Weight at Birth	26 %	9 %	4 %
	Over " " "	32 %	7 %	18 %
	Under " " "	11 %	3 %	3 %
CLASS B	Normal " " "	16 %	11 %	10 %
	Over " " "	7 %	7 %	11 %
	Under " " "	23 %	4 %	14 %
CLASS C	Normal " " "	8 %	6 %	10 %
	Over " " "	3 %	7 %	8 %
	Under " " "	16 %	10 %	16 %

BIRTH WEIGHT

It has often been stated that injury at birth, due to the size of the baby, bears a definite relation to its subsequent development. A study of Chart IV is interesting in this connection, in that while 57 per cent. of all babies overweight at birth fall in Class A, and only 39 per cent. of those of normal birth weight attain the same ranking, further study reveals that when first-born infants alone are considered we find that only 32 per cent. of overweight babies are in Class A as compared with 26 per cent. of those of normal birth weight,—a difference of only 6 per cent. Furthermore, with second-born babies the ratio is reversed, being 9 per cent. of the normal-weight infants in this class as against only 7 per cent. of those over the average in weight. After the second born, however, we note that four and a half times as great a percentage of babies overweight at birth reach Class A as do those of normal birth weight. This percentage variation is large enough to suggest the presence of some factor, such as birth injuries, to first and second babies, which is unfavorable to normal gain during the first year of life. And not only do normal-weight babies of the second pregnancy, in this series, rank higher in percentage in Class A, but they also stand lower in Class C than do babies over the average weight at birth. Another logical finding is the steadily increasing percentage of babies born below normal weight, as one progresses downward from Class A to B, and from B to C.

ABNORMALITIES

Abnormalities were found among the infants of normal birth weight in 17 instances, in those over normal weight in 8 instances; and in those under normal weight in 21 instances. Class A exhibits less than half the number found in B or C, that is, 5 per cent. to 13½ per cent., respectively, of actual cases. These include prematures, whether from twin birth, toxemia or other causes, and instrument babies.

One would expect the larger number of abnormalities in Class C. Such proved to be the case. However, it is somewhat surprising that the infants overweight at birth should show the least, in fact less than half of either those in Class A or C. Comparison of the figures in Chart IV also shows that only 3 per cent. of the first babies that progressed least favorably (Class C) were overweight at birth, as compared with 7 per cent. of those who did better (Class B) and 32 per cent. of the best group (Class A). It may be stated, then, that excess weight at birth is not in itself a severe handicap. That it is worse to be born subnormal in weight, would seem to need no proof. Evidence is at hand to bear this out in comparing the percentages of under weight babies in Classes A, B, and C,—17, 41 and 42 per cent., respectively.

PLACE OF BIRTH

Another factor governing the gain in weight during the first year, which came under investigation, was the place of birth, whether home or hospital. It seemed probable that the hospital would appear to good advantage. This is strongly indicated in the following table:

Class A: cases born at the hospital, 119
At home, 72. Ratio 1.6 to 1
Class B: cases born at the hospital, 83
At home, 84. Ratio 1.0 to 1
Class C: cases born at the hospital, 53
At home, 73. Ratio 1.0 to 1.3

VISITS

There is not much of interest in the comparative results of investigation of the influence exerted by visits to the clinic and by home visits of the nurse in the infant's struggle for gain in weight. We may suspect from the following table that the normally progressing babies visited the physician at the Milk Station clinics less often than those in the next lower class, because they did not need observation as often; but the difference is slight. It is safer to conclude that one factor in the poor showing of Class C may be the fewer clinic visits. The obvious fact that many in the latter group were too sick to leave their homes would, perhaps, nullify this inference.

	Class A.	Class B.	Class C.
Average number of visits to clinic:	5.16	5.30	4.6
Average number of visits to home:	11.53	13.30	14.90

Similarly, the progressive increase in home visits is readily accounted for by the greater need of the poorly progressing infants.

BREAST MILK

It is our conviction that too many physicians advise mothers to wean their infants when any sort of difficulty arises in the nursing period. Much has been written on the value of breast feedings, and the press and popular magazines teem with literature urging continuance of mother's milk as long as possible. Many times when it is not possible to nurse the child entirely, complemental or supplemental feedings may be helpful in maintaining the baby's normal rate of gain. That the rôle of the vitamines of breast milk in these days of—happily—widespread pasteurization of milk, is of definite importance, we believe is indicated from the study of these figures:

	Class A.	Class B.	Class C.
Total number of weeks on breast feedings alone:	602	507	370
Total number of weeks on breast combined with other feedings:	1137	720	638
	1739	1227	1008
Average number of weeks per baby on breast alone:	3.0	2.8	2.9
Average number of weeks per baby on breast combined with other feedings:	5.8	4.0	5.0
	8.8	6.8	7.9

Inasmuch as Class A clearly leads, both in total number of weeks, and in weeks per baby, not only on breast alone but in combination, we may definitely state that human milk is the surest single factor which favorably influences the gain in weight during the first year. This of course is no new truth, but we would like to emphasize once more the importance of continuing its use as long as possible, whether by supplemental or complemental feedings; not to forget proper diet and hygiene, physical or psychical, for the nursing mother.

The increase of the average number of weeks for each baby in Class C over those in Class B may be accounted for by the special efforts made to secure breast milk from both mothers and wet nurses for the undernourished infants who are largely found in this group.

COMPLICATING DISEASES

There can be no question that the diarrhoeas do more to retard the gain of weight of infants during the first year, than any other complicating disease, or perhaps all combined. The compilation shows diseases ranging from various infections of the entire upper respiratory tract in considerable numbers, through fairly numerous exanthemata, to the rarer cases of syphilis, meningitis and septic processes. The details are too voluminous and of insufficient import to warrant reporting them in the present communication. The diarrhoeas alone, then, are cited:

	Class A.	Class B.	Class C.
Number of attacks of diarrhoea:	102	141	85
Number of different babies sick:	82	93	67
Percentage of different babies sick:	42	53	52
Number of severe attacks:	5	12	16

The fact that the great majority of the attacks were mild or moderate needs no comment; nor does the evidence given by means of the percentages, in the several classes, of the fairly even distribution of this disease, with the slight deficit in favor of Class A. But the actual number of severe attacks of diarrhoea shown in the last line of the above table, is not to be slighted as proof of the assertion that the diarrhoeas play an important part in the retardation or defeat of the normal rate of gain in weight. The incidence steadily increases from group to group as the ability to gain decreases.

In conclusion, may we urge the class method of compilation of statistics for comparative studies such as this. The simplicity serves to clarify the mass of intricate detail which results from more specific grouping. Classification, according to rate of gain, combined with the birth weight, seems to present a truer picture than when the latter only is employed. We are fully aware that conclusions could be drawn with more assurance if the cases had numbered thousands rather than hundreds. Nevertheless, we are prompted to offer the appended summary, based on the observations as presented.

Our thanks are due to Miss Luella Thomson and Miss Amy Gould for the keeping of the records at the Milk Station, and to Mrs. F. H. Allen for aid in compiling the statistics for this paper.

SUMMARY

Report of five hundred consecutive cases observed during the past five years presents evidence that:

1. Babies born overweight, in the main, do better than do those of normal birth weight, or those under weight. Normal-weight babies of the second pregnancy, however, outrank both of the other groups.
2. Babies born under weight rank lowest in ability to gain in weight at the normal rate.
3. Abnormalities tend definitely to subvert normal gain in weight, but not particularly in any one group.
4. Hospital-born babies enjoy a distinct advantage over those born at home in likelihood of normal gain.
5. The prolonged use of breast milk, alone or supplemented, tends to increase the rate of gain in weight.
6. Diarrhoea is the most frequent of the complications, and ranks highest among the diseases

tending to prevent the normal rate of gain in weight.

DISCUSSION

Dr. Bagg (closing): Obviously, there are other factors which should have been considered, had time permitted. It would be interesting to compare the effect of season on the gain in weight with the figures reported by Dr. W. T. Porter at the April meeting of the New England Pediatric Society.

A study of the cases by consecutive years might throw additional light upon the influence of disease, notably in 1918, when severe infections of the respiratory tract were so prevalent.

We desired to report the effect of economic conditions on the gain in weight, but the records did not seem sufficiently exact in that respect to warrant conclusions. The point was further obscured because of the special efforts that were brought to bear to carry the bulk of the cases over periods of unemployment by means of temporary or extended measures of relief.

Book Reviews

Insulin. International Clinics, Series 33, 2: 1-54, 1923. Philadelphia and London: J. B. Lippincott Co. Pp. 304.

McPhedran and **Banting** consider a case of diabetes severe if unable to metabolize 500 calories over his basal requirement. . . . Normally when food is absorbed from the gastro-intestinal tract there is an increase in the production of insulin by the islet cells. . . . They remark that insulin shock (hypoglycemic reaction) is less likely to occur in susceptible children if they be given calcium lactate t.i.d. . . . When persistent diarrhea is found in diabetes, the response to insulin is poor, hence achlorhydria should be looked for, and if present treated by HCl and calcium chloride.

Harris calls the discovery of insulin the most notable achievement in the treatment of disease in the twentieth century. . . . He inclines to the belief that insulin has a direct effect upon the nervous system. . . . He quotes Banting as saying to him that "by dieting alone probably 80% of diabetics may be kept well nourished without insulin." . . . For the first two days of treatment, he does the blood sugar twice a day, two hours after insulin. . . . He agrees with Allen as to the etiological importance of pancreatitis. . . . Quotes MacCarrison's experiments and concludes "undoubtedly in many cases of constipation there is associated a colitis which may be the focus of infection for a pancreatitis." . . . Examination of the stomach contents is important because achylia may be the cause of the failure of the pancreas to function.

Hamburger's patient, Myra, aged 11 years, increased in weight by 73% under insulin (p. 28). . . . In another girl menstruation returned after insulin. . . . He reproduces his printed form for records under insulin (p. 35).

Petty aims to give 30 calories per kilo ideal weight for height, as stated in the "Ideal Build Table of the Life Extension Institute" (p. 39; this table appears to be a portion of the Medico-Actuarial (Insurance) Table). If the patient is slender or massive in type, he reduces or increases by 10% the weight in the table. He then composes the diet by giving P 1 g. /k. (more in children), and the rest of the calories derived from 1 g. CH to every 3 g. F. (p. 40). . . . He cites a remarkable case of death from angina pectoris, showing at autopsy an "empyema evidently of many years' standing which burrowed beneath the diaphragm and doubtless caused the pancreatitis and then diabetes" (p. 42). . . . Case H. C. died in coma, although insulin had reduced blood sugar to normal. . . . Case A. H. showed a blood sugar of 1.00%, yet recovered. . . . "All diabetics whom I treat, no matter what the severity of their disease, must be admitted to hospital for at least ten days."

Other Titles (in *International Clinics,* S. 33. vol. 2.

Allergic disease, including Widal's hemoclastic crisis, by van Leeuwen of Leiden.

Pityriasis rosea, with six good photographs, by Klauder.

Electrocardiography, by Wilson, with eight plates, each showing all three leads. Fig. 1 is particularly interesting, showing how the EKG may explain a marked dyspnea when usual physical examination fails (p. 87).

Transfusion, Goodman suggests, could be made available to many by "numbering" and using in turn the many hundreds of public charges in the pay of the city, the donated blood being held in readiness in a central clearing station.

The continuous bath for psychoses is discussed by Hubbard.

The pathology of will, especially as seen in children who seem not to be stimulated to action by their surroundings, is easy reading in the first score of pages of Moore's article.

Encephalitis, according to Lind, causes in more than half the patients psychotic symptoms in the acute stage; and during convalescence in most patients emotional changes, which tend to disappear after a year.

The x-ray in general practice, by Groover, Christie and Merritt, is concisely handled, with 24 admirable plates.

THE BOSTON
Medical and Surgical Journal
Established in 1828

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the printer with galley proof of paper. Upon written request, authors will be furnished free one hundred eight-page reprints, without covers, or the equivalent in pages in articles of greater length.

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Communications should be addressed to The Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston, Mass.

THE STATE CONTROL OF THE TUBERCULOSIS SITUATION

THOSE who followed legislation last winter will recall the several bills relating to the administration of the tuberculosis sanatoria. Great progress has been made in treating tuberculosis throughout the country, and there has been a notable decline in the death rate from this disease. Massachusetts has done a great work in caring for the sufferers from this disease. Sanatoria have been established, designed to care for the pulmonary forms, but the State has not taken active steps toward dealing with the non-pulmonary cases. Many people believe that the policies of the State should be changed. Although the subject received considerable attention by committees of the Legislature, and the State Department of Public Health issued a voluminous report in which existing methods were analyzed and the tentative recommendation made that counties should take over certain of the state sanatoria, leaving others under state control for the care of children and non-pulmonary cases, no law was enacted. The Legislature evidently was unable to reach a conclusion, and an interim committee was appointed "for the purpose of making an extended study of the tuberculosis situation, with a view to making recommendations for such legislation as it shall deem advisable." This committee has visited all of the state and county tuberculosis sanatoria and nearly all of the municipal tuberculosis hospitals and other institutions engaged in active or preventive tuberculosis work.

On August 29 the committee conducted a public hearing in the State House, occupying most of the forenoon and afternoon and continued the next day.

In the invitation to attend this hearing the committee presented the following questions:

Whether the State should take over the administration of any or all of the county tuberculosis sanatoria.

Whether the State should turn over any of the state tuberculosis sanatoria to the counties.

Whether any change should be made in the maintenance of municipal tuberculosis hospitals, such as affecting subsidies or standards, or with reference to any re-arrangement of county or state sanatoria.

Whether cities now required by law to maintain tuberculosis hospitals should be exempted.

Whether certain counties now exempted by law from maintaining tuberculosis hospitals should be required to do so.

Whether the state sanatorium at Rutland should be given over to the treatment of children and the Westfield Sanatorium turned over to the counties in that section of the State.

Whether the Essex County Tuberculosis Hospital District should be extended to include all of the cities in the county.

Whether a sanatorium or hospital should be set aside for the treatment of non-pulmonary tuberculosis.

Whether legislation should be enacted looking to the extension of preventive measures against tuberculosis, such as fresh-air camps or preventoria for pre-tubercular children.

The committee is to submit its report on or before October 15. The committee also invites communications from all interested in the subject, which may be sent to the Clerk, Thomas F. O'Connor.

It may be recalled that a law was passed several years ago, requiring certain counties to erect sanatoria. Two of the large counties postponed action, and later when the war conditions indicated that institutions could not be built and equipped without unnecessary expense, Worcester and Middlesex counties were given until 1925 to meet the legal requirements because of these conditions.

Essex County has erected and equipped one of the finest sanatoria in the country, but at an expense of over $1,470,000, with a bed capacity of 210. This expenditure, together with the possibility of other needed additions in the future, as suggested by one of the county commissioners, is a burden on the county, and there is active opposition to any plan which will compel Essex County to carry this load. It was brought out at the hearing that the per capita weekly cost varies from $22 to $26 a week, depending on the number of patients under treatment. At the present time only about half the beds are occupied. This dissatisfaction is accentuated by the assessment on the unexempted municipalities. At present the law provides that a municipality which provides a sanatorium for its people may be exempt from assessment for the cost of a county institution, and in Essex the larger cities of Lawrence, Haverhill and Lynn each have a sanatorium. This puts a great burden on smaller places; for example, Swampscott, which has been assessed $90,000, has averaged to have only two or three patients in the county sanatorium, according to the statement of its town solicitor. Other smaller places that have never sent patients feel that the assessment is extortionate.

The county commissioners of Essex and representatives of many of the smaller places argued strenuously for the plan to have the State take over the county institutions.

Dr. Clark of Haverhill, long interested in the problems of municipal care of tuberculosis patients, made a logical argument in favor of institutions located near to the friends of patients. He believed in the segregation of these cases in order to prevent infection and also in order to teach consumptives and their friends how to live.

The main argument presented by those in favor of having the State take over the county sanatoria is based on the claim that the State can administer the institutions on a generally approved plan which implies the best possible treatment at the least possible expense.

The argument in favor of county institutions is based on the belief that counties should administer their own affairs and provide sanatoria accessible to the patients and their friends. If the State compels the counties to adopt this plan Worcester County would, according to the recommendation of the State Department of Health, unite with Middlesex and buy the North Reading institution. In all probability Worcester County would find many objections to this plan, and would find it exceedingly difficult to carry on an institution in conjunction with another county and would also object to the distance, which is far from some parts of the county.

The Legislature certainly has a hard and important task before it, for it involves first, great humanitarian considerations, and second, large financial problems. Among all the conflicting views it is quite generally agreed that the State should take on the intensive study of non-pulmonary tuberculosis problems. Although much has been done along this line at Tewksbury it is reasonable to feel that a special institution for this class should be provided.

In considering the whole subject the fact that tuberculosis seems to be a declining disease at the present time should be kept in mind in order to avoid the mistake of spending an unnecessary sum of public money. In some places even now, there is not a demand for all beds that have been provided. With the present knowledge perhaps it may be reasonable to suspect that the same results could have been accomplished under other plans, but the great benefits that have been secured justify past experiments, for human intelligence can seldom definitely deal with untried problems to the best advantage in advance of experience.

* * *

PHYSICAL EXAMINATIONS AT THE BOSTON HEALTH SHOW

In the issue of August 16, the report of a meeting held at the Medical Library August 3, was published. It was the sense of that meeting that any public demonstration of physical examinations was unwise. At an informal conference soon after this meeting, at which the State Department of Health and the Boston Board of Health were represented by the Commissioners and others, Dr. Carey and Mr. Morison reported more in detail their impressions of the effect of the demonstration in St. Louis, and it was decided to ask physicians to meet again and discuss the advisability of some modification of this feature of the Health Show. Dr. James S. Stone presided at this second meeting, held August 23, and after remarks by Dr. Carey, Mr. Morison and others, it was voted that it is the sense of this meeting that a plan of conducting physical examinations at the coming Health Show, supervised and arranged for by the physicians of Boston, is feasible. Under another motion Dr. Stone was authorized to appoint a committee of physicians who should take charge of the details of this plan.

During the discussion it was evident that the only plan which would meet the approval of those present would confine the public part of the exhibition to the simple procedures of recording height, weight, pulse and blood pressure as a preliminary to a physical examination in private rooms, this physical examination to be patterned after the methods required by life insurance companies. Although it was conceded that some observers would be skeptical and not impressed with the importance of physical examinations, the literature distributed in and about this center, together with short speeches, would convey a more or less definite idea of the wisdom of having periodic examinations. Those who apply for and submit to a really thorough examination would probably come to realize more fully the advisability of following this custom. Taken all together, the benefits to be secured will depend entirely on the coöperation of physicians of Boston. If the plan can be carried out by men who are well known it may accomplish a great deal in popularizing the general adoption of this scheme designed to demonstrate to individuals definite physical dangers.

If the people will generally adopt this custom, illness may be prevented or postponed, and general well-being prolonged.

ANTITOXIN TREATMENT OF DIPHTHERIA

The Chicago Department of Health has published the subjoined statistics setting forth the value of the early employment of antitoxin.

"Out of a total of 8372 cases, 624 cases were given antitoxin on the first day of the attack with only two deaths resulting. In 2181 cases antitoxin was given on the second day of the attack with only 33 deaths, or 1.51 per cent. In 2926 cases antitoxin was given on the third day of the attack with 99 deaths, or 3.38 per cent. mortality rate. In 1578 cases in which antitoxin was given on the fourth day there were 176 deaths, or 11.15 per cent.; and out of 1063 cases in which antitoxin was administered on the fifth day or later, there were 234 deaths, or 22.01 per cent.

"If the above figures show anything, they certainly indicate in no uncertain way the importance of early diagnosis and prompt administration of antitoxin. Call your doctor early and have antitoxin administered."

It is also believed that the value of the Schick test and the application of toxin antitoxin is greater even than the therapeutic use of antitoxin. And yet our antis of various sorts would deprive us of these blessings and let the slaughter of the innocents go on. A strange phase of human behavior is shown in the opposition of unscientific minds to some of the most beneficent measures ever devised for the prevention and cure of fatal diseases.

DR. YAOI YASHIOKA

There is a woman's medical college located in Tokyo, Japan, of which a woman physician is the head. It has graduated many of Japan's most progressive and capable women physicians. The August issue of the *Medical Woman's Journal* contains an article by Dr. Yaoi Yashioka, who founded this college, and today guides its destinies, and because of it and the work done by its graduates, occupies a leading position in the affairs of Japanese medical women.

Miscellany

INFANT MORTALITY

Results of an extensive investigation into infant mortality and its causes in Baltimore, Maryland, have just been made public by the U. S. Department of Labor through the Children's Bureau.

This study is the latest and "in many respects the most important" of the Bureau's infant mortality studies (previous investigations having been made in Johnston, Pa.; Manchester, N. H.; Waterbury, Conn.; Brockton, Mass.; Saginaw, Mich.; New Bedford, Mass.; Akron, Ohio; Pittsburgh, Pa., and Gary, Ind.).

The Baltimore study is especially important because Baltimore is the largest of the cities studied, and also because it is, in its population, the variety of its industries, and the rate of infant mortality prevailing, a typical American city.

Poverty, employment of mothers outside the home, housing below the proper standard, short intervals between births, and the death of mothers at or soon after childbirth were among the conditions causing high death rates among certain groups of babies under one year of age, in Baltimore. Similar conditions were found responsible for high infant mortality rates in other cities.

A summary of the findings of the Baltimore report is as follows:

The mortality in the entire group of 10,797 legitimate births studied was approximately the same as the infant mortality in the cities of the United States birth-registration area for the same year.

Mortality rates markedly above the average for the entire Baltimore group occurred among the colored families, foreign-born Polish families, and the very poor native white families.

Low mortality rates—approximating those in New Zealand, which has the lowest in the world—were found among the babies of foreign-born Jewish mothers and in families of the highest earnings groups.

Breast-fed babies in every group of the population had lower mortality than artificially-fed babies in the same group.

New evidence is afforded by the Baltimore study that poverty is an important factor in infant mortality. Eliminating differences in color and nationality and considering only the babies born to native white mothers, the facts showed that infant mortality rose as the fathers' wages fell: In the poorest families studied, about one baby in six died within the year; in the most prosperous families about one baby in twenty-six died within the year.

Employment of the mother away from home

during pregnancy (which was chiefly in factory work) was accompanied by a high percentage of premature births and high infant mortality, especially from the causes peculiar to early infancy. Employment of mothers away from home during the first year of their babies' lives also markedly increased the hazard to the baby. Room congestion and lack of sanitary equipment in the house were accompanied by death rates above the average.

First-born babies had a mortality slightly higher than second or third babies, but among the later orders of birth the mortality rose steadily.

Babies of mothers under 20 and of mothers of thirty-five years or older showed higher mortality rates than other infants.

Births following a preceding birth by an interval of less than two years had a higher mortality than births occurring after a longer interval.

The babies born to the 105 mothers who died within the year following the babies' birth had the highest mortality in the entire group. When the mothers died within two months after the babies' birth, the infant mortality rate became six times as high as the rate for babies whose mothers lived.

THE LAW AND DISEASE PREVENTION

"A COURT decision important in the annals of health legislation" is the way the United States Public Health Service at Washington characterizes the recent ruling of the District Court of Appeals, Second District, Division 1, of California.

Marie Clemente, arrested and charged with conducting a disorderly house, petitioned the court for a writ of habeas corpus, setting forth that she was being illegally detained and restrained of her liberty by the chief of police of Los Angeles, acting under instructions from the health department of that city not to release her until she had submitted to an examination ordered to be made by the health department for the purpose of determining whether she was affected with a contagious or infectious disease.

The District Court of Appeals held that information that a woman is not only conducting a house of ill fame, but also personally participating in the unlawful acts carried on therein, furnishes reasonable ground to believe that she is affected with an infectious disease, authorizing the health department to enforce quarantine measures against her. The woman was remanded to the custody of the chief of police.

As far back as 1919 the United States Public Health Service, in a bulletin prepared by direction of the Surgeon-General, V. D. Bulletin No. 39, advocated a model city ordinance which provided that all persons reasonably suspected of having a social disease in the infectious stage be examined by the health officer or under his direction. Who might be considered a reasonable suspect in such cases has been a point of controversy in many localities. The recent decision in California, says the Public Health Service, helps to clear up this much debated question.

NEW MAGAZINE IN HEALTH FIELD

IN an attractive new dress, in a more compact and readable form, with its value enhanced by the dignity of print, the most recent number of *Venereal Disease Information*, a monthly publication issued by the United States Public Health Service at Washington, has just come from the press.

This magazine, as the name indicates, is intended primarily for health officers, physicians, nurses and social workers engaged in venereal disease control activities. The present issue contains several special articles, noteworthy among which is one on general paresis. The bulk of the magazine, however, in conformity with the custom established in previous mimeographed issues, is composed of brief abstracts of articles dealing with venereal diseases which have appeared in current publications, both foreign and domestic. The contents are divided into six sections under the heads of special articles, research, diagnosis, treatment, clinical notes, and public health and administrative notes.

For some time past this information has been furnished state health departments, venereal disease clinicians, hospital libraries, medical society libraries, medical school libraries, medical journals, public health nurses' associations, training schools for nurses, social service agencies and other organizations in the form of mimeographed monthly abstracts. The wide use made of the information contained in these abstracts and their popularity so impressed the Public Health Service with the desirability of presenting the information in a more readable form that the new publication is the result.

The subscription price for this new periodical is 50 cents per year, payable to the Superintendent of Documents, Government Printing Office, Washington, D. C.

ELECTRONIC REACTIONS

THE Boston *Post* announces that the *Scientific American* proposes to make an analytical study of the Abrams' theories and machines. Even with the adverse explanations already published, and in the face of this proposed study, the *Post* publishes a superficial account of Abrams' methods, which is good advertising material.

HISTORY OF THE STATE SOCIETY

THE JOURNAL was privileged to look over the manuscript of Dr. Burrage's History of the Massachusetts Medical Society before it went to the printer. Aside from the general scope of the book, a succinct story of the beginning and subsequent life of the old Society and descriptions of special activities in separate chapters, that commended itself to us, there are many features which will appeal to the Fellows. The chapter on the District Medical Societies is of especial interest, beginning as early as 1785 with the establishment of "Corresponding Committees" in ten counties, including Lincoln and Cumberland, now in the State of Maine. Following the reorganization of the Society in 1803, the districts of Worcester and Essex organized societies in 1804. The original petitions for these societies have been reproduced and the first reports of the districts to the Council of the parent Society. The charter of the Berkshire District Society was accepted by that district in 1820, and in 1831 the Hampshire District Society was organized, two years later agreeing to distribute the publications and to collect the assessments of the Fellows belonging to that district. Books from the library to the number of sixty were distributed to the districts, on request, at that time. The establishing of the remaining districts in the years 1839, 1840, 1841, 1844, 1849, 1850—four in that year—1851, 1858 and 1884, is sketched in enough detail to make an interesting story, as are the attempts to change the boundaries of some of the districts and to assign portions of the territory to adjoining districts or to new districts.

The book is approaching maturity and any day the Plimpton Press may announce that labor pains have set in.

* * *

INTERNATIONAL UNION AGAINST TUBERCULOSIS

The Council of Directors of the International Union against Tuberculosis held its annual meeting in Paris on July 26, 1923, at the headquarters of the League of Red Cross Societies. Twenty members of the Council from different countries met under the presidency of Dr. Dewez of Brussels.

Professor Léon Bernard, Secretary-General, gave an account of the development of the Union since the Brussels conference. It was decided that the following questions should be placed on the agenda of the conference to be held at Lausanne in September, 1924:

(1) Relations between pregnancy and tuberculosis, to be reported on by Professor Forssner (Stockholm).

(2) Do there exist naturally or can there be produced artificially saprophytic forms of Koch's bacillus which might become virulent tuberculosis bacilli? Report by Professor Calmette (Paris).

(3) Effects of the organization of the anti-tuberculosis campaign in different countries on the decrease in tuberculosis mortality. Report by Sir Robert Philip (Edinburgh).

The report of Professor Bosançon (Paris) on the question of the "respective value of techniques for research of Koch's bacillus for diagnosis of lesions in human tuberculosis" gave rise to an interesting discussion. This report will appear in the next number of the Bulletin of the International Union against Tuberculosis.

* * *

RUSSIA'S NEEDS

THE Medical Section of the American Friends Service Committee have sent a new appeal for help for Russian children. A "Children's Week" was held recently all over Russia to raise funds for the homeless children. An insight into the distressing conditions in that country under which large numbers of children in Russia are living at the present time is given by the subjoined extracts from a letter:

"The war, disorganization and the unprecedented famine which followed them, left a terrible legacy. Millions of homes have been destroyed and made desolate by the effects of this calamity. Millions of children have been deprived of parents, home, and bread. Thousands of waifs roam about the cities and the country, stupefied and disfigured beyond recognition through misery, privation and hunger, begging for sustenance, while thousands die on high roads and streets from sheer exhaustion and disease. Crime and prostitution among the young is growing, and their life has assumed the most distorted and unnatural forms. It is necessary to open up new workshop schools, to repair and re-equip the existing ones, and for this purpose, in addition to money, tools for cobbling, carpentering, bookbinding, sewing, etc., are required.

"All the forces of the state have been mobilized to fight this calamity, but they are insufficient. The functioning children's institutions are unable to accommodate the whole army of homeless children, and the funds to open new ones are lacking. The functioning children's institutions, which provide asylum for over a million orphans, are experiencing acute need in proper dietetic feeding, clothes, under-equipment, etc.

"If the war and the famine have left their inevitable mark on the organism of the adult population, contributing to the spread of disease and mortality, the child's constitution has been so undermined that it is a rare thing now to find a healthy child among the millions of these homeless children. In addition the waifs are subject to moral and psychic deterioration. This is the most tragic feature of this distressing situation. It is difficult to find a really physically and psychically normal child among them. In this regard a well-organized system of expensive medical aid is absolutely necessary.

"There are a large number of children in the institutions of the Department for Protection of the Health of Children and Juniors, but even here there is a keen shortage of necessary clothing and medical supplies.

"Too great, however, is the danger which threatens the growing generation, and too limited the funds for successfully solving the problem. The country appeals to each and all to assist in making the 'week' a success.

"Yours very truly,
"(Signed) K. LANDER,
"Representative Plenipotentiary R.S.F.S.R. and U.S.S.R. with all Foreign Relief Organizations.
"(Signed) DR. SHIMELIOWITCH,
"Chief, Organization Department."

News Items

REMOVAL.—Dr. William J. Porter has removed from Winthrop, Mass., to Reading, Mass., where he will operate a sanatorium and engage in general practice. He will be located on Prospect and King streets.

DR. C. L. OVERLANDER has removed to 443 Marlborough Street, Boston.

DR. JOSEPH GARLAND has removed to 270 Commonwealth Avenue.

DR. RICHARD H. MILLER has removed to 270 Commonwealth Avenue.

WEEK'S DEATH RATE IN BOSTON.—During the week ending August 25, the number of deaths reported was 170, against 170 last year, with a rate of 11.50, against 11.61 last year. There were 20 deaths under one year of age, against 34 last year. The number of cases of principal reportable diseases were: Diphtheria, 52; scarlet fever, 15; measles, 14; whooping cough, 12; typhoid fever, 3; tuberculosis, 39. Included in the above were the following cases of non-residents: Diphtheria, 5; tuberculosis, 4. Total deaths from these diseases were: Diphtheria, 1; measles, 1; tuberculosis, 8. Included in the above were the following cases of non-residents: Diphtheria, 1; tuberculosis, 2.

Obituary

GEORGE WILLIAM HUBBARD, M.D.

DR. GEORGE W. HUBBARD, a practicing physician of Springfield, died in that city August 11, 1923, after an illness of eighteen months, at the age of fifty-one.

Dr. Hubbard was born in Hatfield, June 22, 1872, the only son of Charles E. and Julia (Dayton) Hubbard. He received his academic education at Smith Academy, Hatfield, and at Amherst College. He studied medicine at Johns Hopkins Medical School and at the College of Physicians and Surgeons in Baltimore, graduating at the latter in 1894. Upon his graduation he practiced medicine in South Hadley from 1894 to 1908, moving to Springfield in the latter year.

Dr. Hubbard was a member of the American Medical Association, the Massachusetts Medical Society, the Hampden District Medical Society, and the Springfield Academy of Medicine. He was a thirty-second degree Mason and a Shriner, being a member of Melha Temple. He was also a member of the Nayasset Club.

He is survived by his widow, Mrs. Betty Brown Hubbard, but leaves no other near relatives.

Correspondence

THE NATIONAL TUBERCULOSIS CONFERENCE AT BIRMINGHAM, ENGLAND.

Mr. Editor:

Tuberculosis is constantly bringing before the nations of today new problems closely interwoven with those of national life. More and more are we dealing with these problems in their broader aspects, realizing the close relationship of this disease to the social and economic life of the people. This was particularly apparent when, after having studied some of the tuberculosis work being done on the Continent, I had the good fortune to attend the Annual Conference of the National Association for the Prevention of Tuberculosis, held at Birmingham, England, on July 12, 13 and 14.

This Conference was attended by medical men and representatives of local authorities from all parts of Great Britain, and was of particular interest to an American as the discussions touched upon many of the questions confronting the work in our country today.

One of the most important discussions dealt with the infectivity and segregation of the advanced case of tuberculosis. Dr. William Robertson of Edinburgh laid particular emphasis on the infectivity of the advanced case and was of the opinion that segregation of these cases was quite as important as the isolation of smallpox, and that in those cases who could not be cared for in their homes the public authorities should be given the power to issue warrants for their enforced removal to sanatoria. This statement created considerable discussion, Dr. F. N. K. Menzies of London believing that the infectivity of the advanced case was greatly exaggerated, and favoring home segregation when feasible. Dr. Fergus Hewat of Edinburgh stressed the importance, in his opinion, of the removal from the home of bed-ridden patients where proper nursing is impossible, of those who live in contact with children, and of patients who refuse to comply with the necessary preventive measures. Dr. S. Lyle Cummins of Cardiff, however, was most emphatic in opposition to compulsory segregation, feeling that it was certain that attempts to conceal disease would become even more common than at present, and that in the end little would have been accomplished except to interfere with the liberty of a large section of the community at the expense of the financial prosperity of the rest.

Local attempts in Birmingham to reduce the amount of tuberculosis derived from infected milk were told in a most interesting way by Mr. John Watson and Mr. Brennan De Vine, chief veterinary officer of Birmingham. They spoke of the splendid results which had been achieved in reducing the percentage of reactors among the Birmingham herds, by tests and by methods of selection and elimination. A most interesting point brought forward by Mr. Watson was the investigation by the Birmingham Drainage Board through isolation, confirming the fact that tuberculosis among cows and heifers is not necessarily inherited. Sir Gilbert Barling of Birmingham was of the opinion that surgical tuberculosis in children was largely derived from the cow, and that the number of these cases is distinctly decreasing in Birmingham. Dr. John Fraser of Edinburgh was also a great believer in the overwhelming importance of the bovine infection, and felt that the first essential was the preservation of milk from infection and the establishment of a healthy herd of cows. He stated, however, that his experience was that there was no evidence that surgical tuberculosis was decreasing, but rather that the incidence of this disease was higher in 1922 than in 1912. It was his view that this might be attributed to the widespread unemployment and poverty among hospital cases.

Another very interesting and important point discussed was the relative prevalence of tuberculosis among workers in different trades. Interesting statistics were given by representatives from several trades, clearly illustrating the imperative need for detailed study of the factors contributing toward the prevalence of disease in these trades, and for prompt application of such methods of prevention as might be deemed necessary. Dr. Edgar Collis of Wales pointed out that there were three main influences at work conducive to tuberculosis in industry, namely, the aggregation of individuals employed at sedentary work; the alcohol habit, with its consequent lowering of individual resistance; and the exposure to certain dusts containing silica. He felt that better living, the avoidance of overcrowding, sobriety, and the elimination of dust were potent preventives of tuberculosis mortality; and that, owing to the close correlation known to exist between poverty and tuberculosis, the most valuable instrument in the reduction of this disease was industrial prosperity.

The problem of the notification of tuberculosis opened up a wide field of discussion. Dr. G. L. Cox of Lancashire gave some interesting figures showing that the percentage of unreported cases is constantly decreasing; he was of the opinion that the failure to report cases until within six months of death was most frequently the fault not of the physician but of the patient, who had failed to report his illness until the disease was well advanced. Dr. A. S. M. Macgregor of Glasgow emphasized the fact that adequate diagnostic facilities should be provided, with a view of aiding the general practitioner in making an early diagnosis. Dr. Cecil Wall of London held that the object of notification was primarily the health of the patient and the safeguarding of the community, through facilitating steps for disinfection and scientific investigation. He made the following suggestions: That all cases of tuberculosis should be reported every six months; and that not only should every change of address or of doctor be reported, but also every case of suspected tuberculosis.

The Conference closed with a most excellent and comprehensive address on the actual position of the tuberculosis problem today, by Professor Sir Robert Philip, president of the Royal College of Physicians of Edinburgh, giving a survey of the chief features of tubercular infection, based on his accumulated clinical, experimental and pathological observations during the last forty years. He emphasized the fact that tuberculosis must be regarded as an infectious disease, with which the great majority of persons become infected at some period during their life. This fact, however, far from being disquieting, forms one of the most reassuring aspects of the problem; for if, according to reliable statistics, the majority of persons become infected, it is evident that a very large proportion of these must succeed in offering an effective resistance. This makes it all the more important to increase the individual's power to combat the disease. He believes that inexplicable symptoms of ill health and disturbed growth and development in childhood are in many instances due to an unsuspected tuberculous infection lurking in the system, and regards this trouble as a distemper of the young human animal that should be detected and eradicated in the seedling stage; so that, if overcome in time, it may give immunity against a more formidable attack in later life. To attain this end, the immunity of the individual should be increased through the intelligent use of tuberculin and the strengthening of his resistance through improved methods of hygiene. He emphasized the necessity of a systematic search for the earliest manifestations of infection, in order that effective treatment might immediately be commenced, urging that not a single case of tuberculosis should remain unrecognized or uncared for in the community.

Throughout Professor Philip's address there was a note of splendid optimism; and after forty years of participation in this work, he is confident that through constant and untiring effort in the fight against tuberculosis, there will ultimately be achieved a complete and lasting victory.

Randall Clifford, M.D.

TRI-STATE DISTRICT MEDICAL ASSOCIATION

COMPRISING ENTIRE STATES OF IOWA, ILLINOIS, WISCONSIN AND MINNESOTA AND DISTRICTS OF SURROUNDING STATES

Freeport, Illinois, August 22, 1923.

Mr. Editor:

The physicians of the Middle West would deeply appreciate the favor if you will kindly publish in the Boston Medical and Surgical Journal the announcement of the coming annual assembly of this Association, which is to be held at Des Moines, Iowa, October 29, 30, 31, and November 1.

Will you kindly state that the physicians of your State (who are in good standing in their State's Society) are most cordially invited to attend and take part in the program.

This association is a purely post-graduate organization. The entire time of the annual assembly is taken up with scientific study. We are enclosing you a partial list of eminent members of the profession who have kindly accepted to take part on the program. We would appreciate as much publicity as possible in your JOURNAL.

Again assuring you of our deep appreciation,
Very sincerely yours,
W. B. PECK.

Program Committee.—Dr. Walter L. Bierring, Des Moines, Iowa; Dr. E. Starr Judd, Rochester, Minn.; Dr. Dean Lewis, Chicago, Illinois; Dr. John L. Yates, Milwaukee, Wisconsin.

Committee on Medical Advancement and Research.—Dr. Frank Billings, Chicago, Illinois; Dr. Henry Christian, Boston, Mass.; Dr. Lewis A. Connor, New York City, N. Y.; Dr. George W. Crile, Cleveland, Ohio; Dr. John B. Deaver, Philadelphia, Penn.; Dr. John M. T. Finney, Baltimore, Md.; Dr. Campbell P. Howard, Iowa City, Iowa; Dr. Dean Lewis, Member and Secretary, Chicago, Ill.; Dr. Charles H. Mayo, Rochester, Minn.; Dr. John L. Yates, Milwaukee, Wisconsin.

The following is a partial list of the eminent members of the profession who have accepted places on the program:

Sir Robert A. Falconer, President of University of Toronto, Toronto, Canada.

Dr. Fred H. Albee, Professor of Orthopedic Surgery, New York Post-Graduate Medical School, New York, N. Y.

Dr. Edward William Archibald, Associate Professor of Clinical Surgery, University of McGill, Montreal, Canada.

Dr. William S. Baer, Associate Professor of Orthopedic Surgery, Johns Hopkins University, Medical School, Baltimore, Md.

Dr. Willard Bartlett, St. Louis, Missouri.

Dr. Frank Billings, Professor of Medicine, Rush Medical College, School of Medicine, Chicago, Ill.

Dr. Francis G. Blake, Professor of Medicine, Yale University, School of Medicine, New Haven, Conn.

Dr. Hugh Cabot, Dean and Professor of Surgery, University of Michigan, Medical School, Ann Arbor, Mich.

Dr. Richard Cabot, Professor of Medicine, Harvard University, School of Medicine, Boston, Mass.

Dr. Frederic J. Cotton, Associate in Surgery, Harvard University, School of Medicine, Boston, Mass.

Dr. George W. Crile, Professor of Surgery, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Byron B. Davis, Professor of Clinical Surgery, University of Nebraska, School of Medicine, Omaha, Neb.

Dr. John B. Deaver, Professor of Surgery, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Charles P. Emerson, Dean and Professor of Medicine, Indiana University, School of Medicine, Indianapolis, Ind.

Dr. John F. Erdmann, Professor of Surgery, New York Post-Graduate School of Medicine, New York, N. Y.

Dr. Charles H. Frazier, Professor of Neurosurgery, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Leonard Freeman, Professor of Surgery, University of Colorado, School of Medicine, Denver, Colorado.

Dr. Willis D. Gatch, Professor of Surgery, Indiana University, School of Medicine, Indianapolis, Ind.

Dr. Evarts A. Graham, Professor of Surgery, Washington University, Medical School, St. Louis, Mo.

Dr. William A. Jenkins, Professor of Medicine and Clinical Medicine, University of Louisville, School of Medicine, Louisville, Ky.

Dr. Elliott P. Joslin, Professor of Clinical Medicine, Harvard University, School of Medicine, Boston, Mass.

Dr. Frank C. Knowles, Professor of Dermatology, Jefferson Medical College, Philadelphia, Pa.

Dr. Dean Lewis, Professor of Surgery, Rush Medical College, Chicago, Ill.

Dr. William McKim Marriott, Professor of Pediatrics, Washington University, School of Medicine, St. Louis, Mo.

Dr. Charles F. Martin, Professor of Medicine, McGill University, Faculty of Medicine and President of the Canadian Medical Association, Montreal, Canada.

Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minn.

Dr. William J. Mayo, Mayo Clinic, Rochester, Minn.

Dr. Charles N. Meader, Dean and Professor of Medicine, University of Colorado, School of Medicine, Denver, Colorado.

Dr. Oliver H. Pepper, Assistant Professor of Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. G. Canby Robinson, Member of Medical Staff, Johns Hopkins University, School of Medicine, Baltimore, Md.

Dr. Ernest Sachs, Professor of Clinical Neurosurgery, Washington University, Medical School, St. Louis, Mo.

Dr. Clarence L. Starr, Professor of Surgery, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. William S. Thayer, Emeritus Professor of Medicine, Johns Hopkins University, School of Medicine, Baltimore, Md.

Dr. Allen Whipple, Professor of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Ray Lyman Wilbur, President of Stanford University and President of A. M. A., Stanford University, Cal.

Dr. John A. Witherspoon, Professor of Medicine, Vanderbilt University, Medical Department, Nashville, Tenn.

Dr. Hugh H. Young, Clinical Professor of Urology, Johns Hopkins University, Baltimore, Md.

SYMPOSIUMS

University of Chicago, Medical Department (Rush). Supervised by Dr. Dean Lewis, Professor of Surgery.

University of Indiana, Medical Department. Supervised by Dr. Charles P. Emmerson, Dean and Professor of Medicine.

University of Iowa, Medical Department. Supervised by Dr. Walter L. Bierring, Des Moines.

University of Michigan, Medical Department. Supervised by Dr. Hugh Cabot, Dean and Professor of Surgery. Associates, Dr. Thomas Addis, Professor of Medicine, Stanford University, San Francisco, Dr. L. H. Newburg and Dr. A. S. Warthin.

University of Minnesota, Graduate School of Medicine, Mayo Clinic. Supervised by Dr. William J. Mayo.

Northwestern University, Medical Department. Supervised by Dr. Frederic A. Besley, Professor of Surgery.

Western Reserve University, Medical Department, Crile Clinic. Supervised by Dr. George W. Crile, Professor of Surgery. Associates, Dr. T. E. Jones and Dr. U. V. Portmann.

University of Wisconsin, Medical Department. Supervised by Dr. John L. Yates, Milwaukee, Wisconsin.

NOTICES

PROGRAM OF THE EIGHTH ANNUAL NEW ENGLAND TUBERCULOSIS CONFERENCE AND CELEBRATION OF THE TWENTY-FIFTH ANNIVERSARY OF THE FOUNDING OF RUTLAND STATE SANATORIUM

Under the Auspices of Connecticut Tuberculosis Commission, Maine Public Health Association, Massachusetts Tuberculosis League, Rhode Island Tuberculosis Association, Vermont Tuberculosis Association, and Massachusetts State Department of Public Health.

Worcester and Rutland, Massachusetts
September 12 and 13, 1923

Wednesday at Hotel Bancroft, Worcester
Thursday at State Sanatorium, Rutland

All Meetings Open to the Public

Wednesday, September 12, 1923
Hotel Bancroft, Worcester

9.30 *Registration*

10.30 *General Meeting*

Kendall Emerson, M.D., President of Southern Worcester Public Health Association, presiding.
Address of Welcome: Hon. Peter F. Sullivan, Mayor of Worcester.
Response: Willis E. Chandler, President of the Rhode Island Conference.
Address: The National Program for the Control of Tuberculosis. Linsly R. Williams, M.D., Managing Director National Tuberculosis Association.
Address: Where Does Real Tuberculosis Work Begin? Eugene R. Kelley, M.D., State Commissioner of Public Health, Massachusetts.
General Discussion.

2.00 *Health Education.*

Walter D. Thurber, Secretary of Maine Public Health Association, presiding.
A Complete Program of Health Education. Professor C. E. Turner, Massachusetts Institute of Technology.
The Place of the Modern Health Crusade in the General Child Health Program. Miss Louise Strachan, National Tuberculosis Association.
General Discussion.

3.30 *Round Table on Tuberculosis Nursing.*

Elena M. Crough, R.N., State Supervising Nurse of New Hampshire, presiding.
Subject: Problems I Have Met in Tuberculosis Work and How I Have Solved Them.
Chief Discussants: Celia Lemner, R.N., State Tuberculosis Nurse, Massachusetts; Sara Carroll, R.N., Providence District Nursing Association, Rhode Island; Emily Perkins, R.N., State Tuberculosis Nurse, Vermont; Edith L. Soule, R.N., State Supervising Nurse, Maine.

8.00 *Evening Session.*

Edward O. Otis, M.D., President Massachusetts Tuberculosis League, presiding.
Illustrated Lecture on The Scientific Treatment of Non-Pulmonary Tuberculosis. Horace LoGrasso, M.D., Superintendent Adam Memorial Hospital, Perrysburg, N. Y.
Discussion led by Z. B. Adams, M.D., Boston.

Thursday, September 13, 1923

7.30 *Seal Sale Breakfast, Hotel Bancroft, Worcester*

Basil G. Eaves, Campaign Secretary, National Tuberculosis Association, presiding.
Address: Effective Campaign Methods. J. Byron Deacon, New York Tuberculosis Association.

General Session

10.00 *Rutland State Sanatorium, Rutland, Mass.*

Charles F. Dalton, M.D., Secretary State Board of Health, Vermont, presiding.
Address: Progress in Tuberculosis Research. Stephen J. Maher, M.D., Chairman State Tuberculosis Commission, Connecticut.
Chief Discussant: John F. O'Brien, M.D., Superintendent Seaside State Sanatorium, Niantic, Connecticut.

11.00 Sumner H. Remick, M.D., Director Division of Tuberculosis, State Department of Health, Massachusetts, presiding.
Address: Problems of Adult and Childhood Infection as They Affect the Program for the Control of Tuberculosis. Francis B. Trudeau, M.D., Trudeau Sanatorium, Saranac Lake, New York.
Chief Discussants: Harry L. Barnes, M.D., Superintendent State Sanatorium, Rhode Island. Henry D. Chadwick, M.D., Superintendent Westfield State Tuberculosis Sanatorium, Westfield, Mass.

Celebration of Twenty-fifth Anniversary of Founding of Rutland State Tuberculosis Sanatorium

The First Institution of Its Kind in the World

Eugene R. Kelley, M.D., State Commissioner of Public Health, Massachusetts, presiding.
Introductory Addresses: Hon. Channing H. Cox, Governor of Massachusetts; Hon. Frank G. Allen, President of the Massachusetts State Senate; Hon. B. Loring Young, Speaker of the Massachusetts House of Representatives.
Greetings from the National Tuberculosis Association: Linsly R. Williams, M.D., Managing Director.
Greetings from Dr. Pettet of the American Sanitarium Association.
Greetings from Dr. A. K. Stone, representing former Trustees of Rutland.
Greetings from Dr. E. O. Otis, President of the Massachusetts Tuberculosis League.
Address: The Significance of Rutland. Vincent Y. Bowditch, M.D.
Address: The Significance of Rutland to Other States of the Nation. David R. Lyman, M.D.

THE BRISTOL SOUTH DISTRICT MEDICAL SOCIETY

The semi-annual meeting of the society will be held in New Bedford, November 1, 1923. The annual meeting will be held in New Bedford, May 1, 1924.

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CONCLUSIONS REGARDING THE SCHICK TEST

As the result of more than two thousand Schick tests on persons in rural communities of Vermont, Dr. C. W. Kidder, of the United States Public Health Service, arrives at some interesting conclusions, as follows:

1. That both the percentage of susceptibles and the degree of susceptibility to diphtheria are higher in sparsely populated sections than in thickly settled or urban communities.
2. That the percentage of susceptibles among rural people, without regard to class or environment, is higher than that of the well-to-do classes in cities.
3. That in the rural districts, as well as in the cities, the percentage of susceptibles is much higher among the well-to-do than among the poorer classes.
4. That the percentage of susceptibles is much higher among the native born than among the foreign born.
5. That age is a relatively unimportant factor in the immunization of individuals living in strictly rural communities. This conclusion is supported by the fact that of 87 teachers between the ages of 20 and 60 years, included in the group of 2030 persons tested, 82 per cent. gave positive Schick reactions. It was found also that the degree of susceptibility as evidenced by Schick reactions was as high among the susceptible adults as among the susceptible school children.
6. That the higher the degree of susceptibility the less reaction there is from toxin-antitoxin.
7. That those individuals having a positive combined Schick reaction are more likely to have a severe reaction from toxin-antitoxin.
8. That notwithstanding the distances to be covered and the other factors in the relatively high cost and difficulties of such work in rural districts, the use of the Schick test and of toxin-antitoxin for immunization against diphtheria is, in view of the extent and degree of susceptibility to the disease and the frequent lack of facilities for prompt and adequate treatment of cases, especially important in rural communities and should be included at appropriate times in the program of activities of rural health departments.—Bulletin of Indiana State Board of Health.

HEALTHGRAMS

An abundance of pure water is the safest medicine.

The best advertisement for any city is the purity and abundance of its water supply.

Every community is judged by the health and longevity of its inhabitants.

Let us again repeat: "We do not *catch* typhoid, we *swallow* it!"

Vacations serve to get up steam for the next season's efforts.

Streets are not intended for playgrounds.

Roller skating and ball playing cause many street accidents.

Look both ways before crossing a street, and keep looking until you are across.

"He who has health has hope, and he who has hope has everything." (Proverb.)—Buffalo *Sanitary Bulletin.*

DISEASES REPORTED TO THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

WEEK ENDING AUGUST 18, 1923

Disease	*No. of Cases*	*Disease*	*No. of Cases*
Anterior poliomyelitis	9	Pneumonia, lobar	20
Diphtheria	151	Scarlet fever	62
Chicken-pox	30	Septic sore throat	1
Dog-bite	12	Suppurative conjunctivitis	9
Encephalitis lethargica	2	Syphilis	34
Epidemic cerebrospinal meningitis	3	Tetanus	1
German measles	3	Trachoma	2
Gonorrhea	108	Trichinosis	1
Influenza	3	Tuberculosis, pulmonary	117
Measles	76	Tuberculosis, other forms	24
Mumps	21	Typhoid fever	12
Ophthalmia neonatorum	19	Whooping-cough	86

WEEK ENDING AUGUST 25, 1923

Disease	*No. of Cases*	*Disease*	*No. of Cases*
Anterior poliomyelitis	4	Pellagra	1
Chicken-pox	17	Pneumonia, lobar	24
Diphtheria	124	Scarlet fever	56
Dog-bite	6	Septic sore throat	1
Encephalitis lethargica	2	Suppurative conjunctivitis	16
Epidemic cerebrospinal meningitis	3	Syphilis	32
German measles	4	Tetanus	2
Gonorrhea	1[illegible]7	Trachoma	1
Influenza	[illegible]	Tuberculosis, pulmonary	95
Malaria	1	Tuberculosis, other forms	11
Measles	32	Typhoid fever	12
Mumps	23	Whooping-cough	64
Ophthalmia neonatorum	20		

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SOCIETY MEETINGS

DISTRICT SOCIETIES

September, 1923:—Meeting of Franklin and Hampshire District Medical Societies at South Deerfield.

Essex North—Combined Meeting with Middlesex North, Middlesex East and Essex South in October. Semi-annual Meeting at Haverhill, January 2, 1924. Annual Meeting at Lawrence, May 7, 1924.

Bristol South—Semi-annual meeting will be held in New Bedford, November 1, 1923. The annual meeting will be held in New Bedford, May 1, 1924.

STATE, INTERSTATE AND NATIONAL SOCIETIES

September 12, 1923:—New England Tuberculosis Conference at Worcester.

September 13, 1923:—Celebration of twenty-fifth anniversary of the Rutland State Sanatorium at Rutland.

October, 1923:—Boston Health Show will be held in Boston, October 6-13, inclusive.

October, 1923:—Meeting of the American Health Association will be held in Boston, October 8-13, inclusive.

October 18-19, 1923:—Annual Meeting of New England Surgical Society in Boston.

For list of Officers of the Massachusetts Medical Society, see page viii of the Advertising Section.

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A FLYING TRIP FOR VACCINE

Dr. Edward O. Otis of Boston, president of the American Academy of Medicine, and one of the leading authorities on tuberculosis in the United States, is paying a flying visit to this country in order to obtain a supply of the new vaccine against tuberculosis discovered by Dr. Georges Dreyer, Professor of Pathology at Oxford, which has been tried with such great success at the London Hospital.—*The Medical Press.*